NETWORK WORLD
THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

AN INTERNATIONAL DATA GROUP PUBLICATION ◆ VOLUME 11, NUMBER 44 ◆ OCTOBER 31, 1994

Bells get a wake-up call

Sprint eyes local loop overthrow with Teleport, cable team.

BY DAVID ROHDE

New York

Through a joint venture with three giant cable TV providers, Sprint Corp. last week grabbed a big piece of the nation's largest bypass carrier and presented the Bell telephone companies with something they've never had before — the real threat of a mass exodus of local access customers.

Unlike MCI Communications Corp.'s local bypass effort announced earlier this year, the Sprint-CATV venture hits the ground running since it becomes the new owner of Teleport Communications Group, until now held exclusively by cable interests.

Pending approval of the venture, dubbed New Telco, Sprint appears likely to begin steering its business customers to Teleport access lines in many of the markets where Teleport has facilities.

New Telco will try to extend Teleport's reach by using its three cable partners (see graphic) to offer telecommunications services in other local markets. That aspect of the venture, however, faces huge risks given the CATV companies' lack of telecommunications experience and the CATV industry's lackluster service record.

Sprint already serves six million businesses and homes through local telephone companies it now owns, but it has little presence in the 25 largest cities that Teleport has targeted.

Teleport has been certified as a full-service local exchange carrier in four states, meaning Sprint could use the relationship to cut customers' costs - access can account for 40% of calling costs - and provide them with local dial tone.

In New York City, for example, Teleport already has full co-carrier status and serves as Sprint's access

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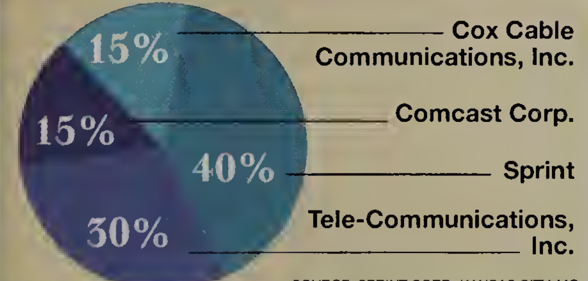
Corralling a CAP

Teleport's new owners (pending approval):



SOURCE: SPRINT CORP., KANSAS CITY, MO.

Playing the field

Cisco's acquisitions and alliances since 1990

1990	Partnered with **Cabletron Systems, Inc.** to develop hub routing modules and team on joint sales.
	Teamed with **Chipcom Corp.** to develop hub routing modules and software.
1993	Bought **Crescendo** for Ethernet workgroup switches.
1994	Acquired **Newport Systems Solutions, Inc.,** a maker of software-based routing technology for network operating systems.
	Allied with **Hewlett-Packard Co.** to build 100VG-AnyLAN adapters for Cisco routers and port Cisco routing software to HP hubs.
	Joined with **UB Networks, Inc.** to develop routing software for UB hubs and switches, and conduct joint sales and service calls.
	Announced plans to buy **Kalpana,** a LAN switching vendor.

GRAPHIC BY SUSAN SLATER

LAN SWITCHES

Cisco rips plum from IBM's hand

BY JIM DUFFY

San Jose, Calif.

Cisco Systems, Inc. last week beat IBM to the quick by snapping up Ethernet switch market-leader Kalpana, Inc. for $207 million — a surprise deal that gives the router maker a wider array of switch offerings and could leave IBM in the lurch.

The move helps Cisco fill out the low end of its CiscoFusion architecture with an established workgroup switch. And Kalpana's indirect sales channels will provide Cisco — which now relies mainly on its own sales force — with a way to further propagate its core routing software.

"Cisco's acquisition of Kalpana allows us to extend our Ethernet as long as possible until we're ready to move to ATM," said David Zimmerman, telecommunications analyst at Rutgers University in New Brunswick, N.J.

But perhaps the most intriguing aspect of Cisco's planned purchase is its effect on IBM, which was expected to

See Cisco, *page 9*

Censors hit cyber-speech

BY ADAM GAFFIN
AND ELLEN MESSMER

Washington, D.C.

On the electronic frontier, there are no lawmen to enforce the First Amendment.

As corporations tie into the Internet, they may come face-to-face with electronic desperadoes who set off network-jamming mail bombs in response to messages they don't like or send out robotic agents that march across the network, deleting a company's public messages.

Gene Spafford has firsthand experience with this kind of cyber-censorship. Two years ago, the Usenet pioneer publicly opposed the use of so-called anon remailers — servers that let users post electronic mail anonymously. It was a bitter enough debate. But then Spafford started getting mail bombs — giant messages aimed at clogging his

See Censors, *page 79*

Terms of displeasure

Cancelbot – This program detects messages sent to multiple Usenet conferences and then sends out "cancel" replies that delete the original messages from Usenet system hard drives.

Mail bomb – To send one massive file or hundreds of smaller files to a single E-mail address to show your displeasure at something the mailbox owner said on-line. Can also be used as a noun.

Spam – From the Monty Python skit involving a restaurant that serves only the pink luncheon meat, this is a message posted repeatedly to multiple Usenet conferences. Can also be used as a verb.

AT&T makes bold play in data warehousing

BY JOANIE WEXLER

New York

AT&T Global Information Solutions last week burst upon the data warehousing scene, announcing immediate availability of a potent platform for managing information scattered across networks.

The company has integrated its massively parallel processing and Teradata database technologies with third-party database tools and AT&T-developed market and sales analysis applications. The goal is to give customers a single logical view of networkwide data so they can uncover trends and relationships.

The vertical markets for which AT&T has created application

See AT&T, *page 80*

Strange bedfellows in push to extend ATM

BY MICHAEL CSENGER

Companies looking to make the jump to campus ATM nets will soon find an unlikely ally in plain old circuit-switched wide-area services.

Several vendors are working on products that will let customers connect remote offices, even telecommuters, into Asynchronous Transfer Mode nets using ISDN and switched 56K bit/sec services.

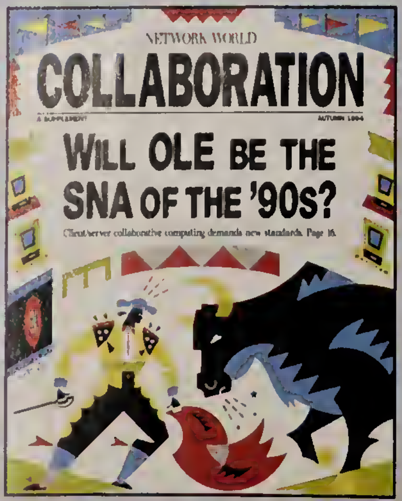
Ascend Communications, Inc., First Virtual Corp., Premisys Communications, Inc. and Teleos Communications, Inc. are among those developing such products now, while AT&T readies a gateway for its private branch exchanges that will also figure into the mix.

See Bedfellows, *page 80*

INSIDE

New organizational models. New technologies. New standards. The shift to collaborative computing is forcing the reevaluation of many of today's core architectures, including the vaunted SNA. This issue examines the fundamental changes.

Follows page 41.



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Briefs

Novell, AT&T forge PBX-to-LAN links. Novell, Inc. and AT&T will announce this week a new version of NetWare Telephony Services (NTS) with technology for tracking and managing call volume between a private branch exchange and NetWare network. The upgrade, due in the first half of 1995, will also include a utility to upgrade NTS users to NetWare Directory Services, as well as support NetWare 4.1, run on OS/2, Windows NT and Macintosh clients, and run across TCP/IP. Users will still have to wait, however, for delivery of promised drivers for PBXs other than AT&T's.

Warped Warp. A bug found last week in IBM's OS/2 Warp installation program does not threaten the operating system's availability, an IBM spokeswoman said. IBM delayed manufacturing briefly to fix the bug, which can corrupt a hard drive's CONFIG.SYS file. Anyone who receives the earliest version can avoid the problem by renaming any existing CONFIG.BAK files before installing Warp. The operating system is a key part of IBM's challenge to Microsoft Corp.'s desktop dominance.

IBM goes for groupware. IBM will announce at Comdex on Nov. 15 the core of its entry into the groupware wars. The Group Communications offering will provide a seamless interface between IBM's Ultimedia Mail client/server electronic mail system, Time and Place/2 calendar and scheduling software, a fax application and an X.500-compliant Address Book (*NW*, July 4, page 1). The new groupware product will run on top of the MQSeries messaging software and will initially support OS/2, AIX, Windows and Application System/400 servers with OS/2 and Microsoft Corp. Windows clients. Beta tests begin in November for the product, which is set for release during the first half of next year for between $50 and $100 per client.

MCI catches on. MCI Communications Corp. last week held an official ribbon-cutting for its Professional Services Network Management Center in Arlington, Va. The center will provide 24-hour network monitoring for MCI's managed frame relay network clients. AT&T and Sprint Corp. have similar facilities up and running in New Jersey and Virginia, respectively.

Concentrators and cable TV from Cisco. Cisco Systems, Inc. last week announced a new Copper Distributed Data Interface (CDDI) and Fiber Distributed Data Interface (FDDI) workgroup concentrator. The new C1400 CDDI/FDDI Workgroup Concentrator can be configured with 16 to 32 CDDI ports and four to 20 FDDI ports. Available immediately, the C1400 is priced from $7,995 to $18,490.

Also last week, Cisco announced it is a founding member of a forum that will use cable television to deliver broadband cable services to homes and businesses. Cable/Information Technology Convergence Forum members also include Apple Computer, Inc., Bay Networks, Inc., Compaq Computer Corp., Digital Equipment Corp., Fore Systems, Inc. and LANCity.

3Com keeps pace in multimedia. 3Com Corp. announced last week its effort to make multimedia applications practical for switched Ethernet networks (*NW*, Oct. 24, page 1). The company promised to deliver sometime next year Ethernet switches that can prioritize multimedia traffic using its new Priority Access Control Enabled (PACE) technology. The switches will probably cost about $150 per port and work with established Ethernet networks. 3Com will license the technology to third parties, including competing hub vendors, company officials said.

SNA over IPX. IBM this week will announce a new version of AnyNet for OS/2 that lets Novell, Inc. IPX traffic flow over Systems Network Architecture backbones. The AnyNet for OS/2 IPX Gateway will also let SNA users gain access to resources on NetWare LANs. AnyNet implements IBM's Multiprotocol Transport Network technology, which lets applications communicate across the enterprise regardless of the underlying communications protocol. Pricing was not available.

Taking control of E-mail. Control Data Systems, Inc. last week announced a graphical management application for its Mail-Hub messaging switch. Via the Advanced Operations Manager, users will be able to monitor and change a variety of settings related to the switch's X.400 transport mechanism and X.500 directory. Pricing starts at $5,000.

CDS: (800) 257-6736.

For details on how to reach us, see page 82.

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Network HELP desk

Network World tracks down answers to your questions regarding products, services, technologies or disputes with vendors. Please submit questions to Dana Thorat at (800) 622-1108, via fax at (508) 820-1103 or (508) 820-3467, via the Internet at djt@world.std.com or via CompuServe at 73244,2673.

I am looking for data communication service providers that offer 56K bit/sec or T-1 links between the U.S. and the Far East, specifically mainland China, Hong Kong and Taiwan. Do you have any information on the service providers and their fee schedules?

Yun Fei, Boston

Lawrence Uline, a senior consultant at Lynx Technologies, Inc., a Little Falls, N.J.-based consultancy specializing in the design and implementation of international telecommunications networks, replies:

AT&T, Sprint Corp., IDB WorldCom, Inc. and Western Union International (now owned by MCI Communications Corp.) all provide 64K bit/sec and T-1 leased-line channels to Hong Kong and Taiwan via undersea cable or satellite links. Normally, 56K bit/sec channels are not provided from the U.S. to these countries. For more information about these services, call the AT&T Global Customer Service Center at (800) 448-8600, Sprint at (202) 828-7424, IDB WorldCom at (213) 269-9111 and Western Union International at (617) 937-7700.

As for mainland China, there is no direct channel from the U.S.; it must be accessed via Hong Kong or Japan. To access mainland China, your best bet is to make arrangements with Hong Kong Telecom International, Ltd. to extend a U.S.-to-Hong Kong leased line to mainland China. To contact Hong Kong Telecom, call (852) 888-2888.

Depending on the service provider and the length of the contract, monthly charges for digital service via undersea fiber-optic cable from the U.S. to Taiwan range from $8,600 to $12,000 for 64K bit/sec and $71,000 to $84,000 for T-1. From the U.S. to Hong Kong, monthly charges range from $7,300 to $11,900 for 64K bit/sec service and $60,000 to $104,000 for T-1. And from Hong Kong to mainland China, charges are $4,100 for 64K bit/sec, $6,400 for 128K bit/sec and $8,800 for 192K bit/sec.

For more information about international telecommunications services, tariffs, carriers and coun-

See Helpdesk, *page 49*

Carriers scramble to ally on wireless front

MCI's strategy appears to be hazy.

BY JOANIE WEXLER

Carriers committed to building nationwide wireless networks last week continued to pump up their financial and marketing muscle with partnerships and alliances.

The latest round of industry shuffling, highlighted by Sprint Corp.'s deals with several local communications firms, continued right up to last Friday's Federal Communications Commission deadline for registering to bid at the upcoming personal communications services (PCS) spectrum auction.

Many carriers hope to gain PCS licenses at the Dec. 5 auction to plug coverage gaps throughout the U.S. Bidders are jockeying for position in the race to build cohesive, coast-to-coast wireless networks that will be easier to use and have more consistent pricing than today's disjointed cellular nets.

The PCS auction will open up islands of frequencies in the 2-GHz range to new and established network operators looking to offer voice, data, paging and other services across the airwaves.

Sprint thrust its wireless stake in the ground via an alliance with several cable companies and an equity stake in competitive access provider Teleport Communications Group. It aims to fill wide coverage holes in its Sprint Cellular operation (see graphic) and enter the local services market (see story, page 1).

The Sprint moves came on the heels of several other developments. These include a statement from MCI Communications Corp. that it would not file at the auction, leaving itself open to minority partnerships with the winners and/or reselling excess capacity from other carriers; and the consolidation of four regional Bell holding company cellular subsidiaries.

The RBHC players — Bell Atlantic Mobile Systems, Inc., NYNEX Mobile Communications, US WEST Cellular and AirTouch Communications — hope to ally on a cohesive marketing campaign and a single "look and feel" for cellular and PCS customers. Today, the companies said, they collectively have cellular licenses in 15 of the top 20 cities.

Separately, BellSouth Corp. said Friday it would bid on licenses throughout its nine-state principal operating area as part of a consortium including 35 independent telephone companies, and the firm will broaden its footprint via alliances with other wireless companies nationwide.

CAN MCI COMPETE?

The haziest strategy is MCI's.

"If you have AT&T able to differentiate itself with a wireless package [via its recently consummated acquisition of McCaw Cellular Communications, Inc.] and MCI is in a reseller situation, AT&T has the upper hand," said Jacquelyn Popp, a high-yield analyst with Duff & Phelps Investment Research Co. in Chicago.

Customers, though, are likely willing to choose one carrier for traditional WAN services and another for wireless. In fact, David Eisenlohr, vice president of telecommunications and computer operations at the Pacific Stock Exchange in San Francisco, an MCI shop, said he might prefer different carriers to ensure backup alternate routing.

At this juncture, though, most users seem mildly interested, at best, in these issues.

"It is too early for us to get into wireless," said Mark Trimble, executive vice president at Gall's, Inc., a specialty catalog company in Lexington, Ky., and an MCI customer that as yet has no mobile work force.

Similarly, temporary employment company Adia Personnel Services in Redwood Shores, Calif., another MCI customer, has not looked into wireless.

"Eventually, though, we will, and I would rather do one-stop shopping. It's usually easier and you get better support," said Patrick Myreholt, data communications manager at Adia.

"And adding that traffic to my volume discount would be an incentive," he said.

Eisenlohr said he is skeptical of what initial PCS user costs will be. This is a key question because there is no broadband PCS standard, and infrastructure costs depend on the technology used.

Without a standard, bidders won't know what their build-out costs will be and, thus, will have a tough time knowing what to bid at the auction. This means they will not know for some time what customer costs will be, observers said, and interoperability problems could occur, should carriers choose different technologies.

The wireless landscape

Providers	General areas covered today	Areas with no or little coverage where PCS licenses could help
AirTouch/BAMS/ NYNEX/US WEST	Northeast, mid-Atlantic region, central Ariz., Calif., northern Ga., Idaho, central Ill., central and southwestern Iowa, northeastern Minn., southern N.C., Nev., N.M., eastern N.D., northern S.C. and northern Utah	Ala., Fla., Ind., Kan., Ky., La., Miss., Mo., Mont., Neb., Okla., S.D., Tenn., Texas and Wis.
AT&T/McCaw	Ala., Fla., Ga., Hawaii, Ind., La., Tenn. and southern Wis.	Ariz., central Ill., Iowa, Neb., N.M., N.C., S.C., southern Va. and northern Wis.
BellSouth	Chicago, Calif., southern Canada, central Colo., southeastern Texas, Northeast and Pacific Northwest	Pacific Northeast, Northwest and Rocky Mountain states
MCI	None	All
Sprint Cellular	Southeastern Ala., northern and southwestern Ariz., northwestern Fla., northern Ind., N.C., southern Nev., northern Ohio, Pa., S.C., and central and northeastern Texas	Calif., upstate N.Y., Midwest, Northeast, Pacific Northwest and Rocky Mountain states

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Looking to strike gold, IBM details Karat mgmt. pieces

BY MICHAEL COONEY

Paris

IBM last week spelled out new details on its object-oriented Karat management technology, saying its first iteration will include more than 20 products for managing distributed enterprise networks and systems.

Among the products IBM expects to include in the first release of Karat will be NetView for AIX, Systems Monitor, Trouble Ticket/6000, LAN Management Utilities for AIX, NetView Distribution Manager and all management applications for IBM bridges, hubs, routers and Asynchronous Transfer Mode switches, said Kathleen Kincaid, director of SystemView marketing. As Karat-compatible products, they will be able to be fed data and take commands from a central Karat-based console.

Tools to help users build objects and object class libraries will also be included in the first Karat go-round, along with applications to help users balance work loads among different platforms, discover topologies and track alerts.

At an IBM Networking Systems briefing here, IBM executives said that rolling out Karat products will be one of the top three priorities Big Blue will focus on for 1995, joining ATM and Advanced Peer-to-Peer Networking/High Performance Routing products.

IBM has been criticized in the past for rolling out grand management schemes, such as SystemView, that ended up comprising more promises than products. But Karat is on track, and IBM is being far more deliberate about delivering details than before, analysts said.

DETAILING KARAT

Karat is object-oriented management technology IBM will use to build common management applications across all of its major systems. It contains IBM's System Object Model (SOM) and Distributed SOM code, as well as Common Object Request Broker Architecture technology that third-party developers can use to build their own objects on top of Karat (*NW*, Sept. 19, page 1).

"One of the primary goals with Karat is to give users deploying distributed systems the kind of reliable and efficient automated network and systems management that mainframe users have enjoyed for years," Kincaid said. "We aren't just cobbling together applications; we are integrating existing management applications with new object-oriented applications — all working together."

The first implementations of Karat will appear in the first half of 1995, though some beta sites already exist, noted Kincaid. The first products out the door will enable IBM's AIX and OS/2 and Microsoft Corp.'s Windows machines to function as Karat consoles. Late next year, Karat will be rolled out for the Application System/400 mid-range and MVS mainframes.

Plans are also in the works for Karat to work with Digital Equipment Corp., Sun Microsystems, Inc. and Microsoft Windows NT platforms in the near future, Kincaid said.

Karat applications will be able to receive management data from AIX, OS/2, DOS and Windows clients running new agent software built on the Desktop Management Task Force's Desktop Management Interface (DMI). IBM recently announced that it will implement DMI on all of its distributed platforms and use it to feed information to Karat-based systems (*NW*, Oct. 7, page 4).

Other DMI-compliant systems, such as those from Compaq Computer Corp., Digital and Novell, Inc., will also be able to feed management information to Karat systems.

DMI code is built into PC operating systems and other products such as LAN adapters to let users collect a variety of systems information, such as configuration, available disk space and adapter performance. Data gathered via the DMI is stored on the desktop in a Management Information File, which has the ability to map the data to any standard management platform.

For example, a router could signal a local performance monitor, such as IBM's AIX Performance Toolbox, if its capacity was taxed and throughput was lagging. The AIX Performance Toolbox would automatically open a trouble ticket in IBM's Trouble Ticket/6000 and notify the central management platform of the problem.

"Today, users would have to work with each product, the performance monitor, trouble ticket and management platform separately," Kincaid said.

"With Karat, all of these different procedures are integrated and interact automatically," he said.

IBM will also package Karat products in a new fashion, enabling users to choose from a menu only those applications they need, which IBM will then deliver in a single integrated package.

"We'll also automatically ship updates as they need them," Kincaid said.

According to Anura Guruge, an independent analyst based in New Ipswich, N.H., Karat is only an inkling of things to come.

"IBM is setting a foundation that, in the next 12 to 18 months, will yield a state-of-the-art way for users to implement distributed network and systems management products," he said.

More from Paris...

Rick McGee, director of IBM's networking controller line, said he has doubled manufacturing capacity to keep up with the demand for the company's 3746 Model 900, an expansion box for the 3745 front-end processor.

Antoine Granatino, division director of IBM campus networking products, said IBM is developing a standard interface for its 8260 ATM hub so the hub can be linked to PBXs, enabling users to carry voice over campus ATM nets.

CORRECTION

An article on IBM's Resource Object Data Manager (RODM) technology (June 27, page 59) incorrectly stated that IBM has not shipped its Advanced Peer-to-Peer Networking Topology and Accounting Management (APPNTAM) product. The product has been available since January.

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Lotus, Sybase in talks on melding Notes, SQL Server

BY BARB COLE AND ADAM GAFFIN

Cambridge, Mass.

Lotus Development Corp. and Sybase, Inc. have begun discussions on ways to tightly integrate Notes with the SQL Server 10 database, according to users briefed by Sybase.

If an agreement is reached, the deal would be similar to that announced by Lotus and Oracle Corp. in September (*NW*, Oct. 3, page 1). They agreed to link Notes to Oracle's planned Documents client/server groupware offering, which is based on an Oracle database.

Lotus and Sybase declined to comment on whether a deal is pending. However, some Sybase users reported being told an announcement is imminent.

Tighter integration between Notes and Sybase would give Notes users quicker access to information stored in back-end Sybase databases. Lotus and third-party vendors now offer a variety of tools that let Notes applications extract Sybase data, but they are typically based on Microsoft Corp.'s Open Database Connectivity specification, a generic interface that is not optimized for any particular database.

Notes-to-SQL Server integration could enable users to construct decision-support applications based on Notes that also could take advantage of the security and data integrity features of a relational database.

Notes uses an object store particularly suited for housing and manipulating unstructured data, such as compound documents. As Lotus readily admits, this database is not well suited for transaction processing or structured data handled by relational databases.

"This kind of integration gives Notes the industrial-strength capabilities it needs to be used throughout the enterprise, not just at the desktop," said Sadie Decker, vice president of advanced information technology at Tele-Communication, Inc., a Sybase and Notes user in Englewood, Colo.

Richard Finkelstein, president of Performance Computing, Inc. in Chicago, said the move makes sense given that "Notes just doesn't provide the kind of data integrity that people are looking for."

Tighter integration of Notes and SQL Server could also prove especially useful to the many financial institutions that have installed both the Lotus and Sybase software, said Jeff Held, a partner in the technology services practice at consulting and accounting firm Ernst & Young in New York. He said the integration would provide speedier access to data.

David Marshak, an analyst with the Patricia Seybold Group, Inc. consultancy in Boston, said the talks show Lotus is serious about being vendor-neutral when it comes to back-end databases. At some point, however, the company may have to pick one of the database vendors as a more exclusive partner.

"Lotus probably can't integrate as tightly with everyone at the same time," he said.

Shipshape?

Last week, Lotus said it has begun shipping beta versions of Notes 4.0 to business partners. Even though the company continues to specify a mid-1995 delivery date, it cautioned that date could slip.

BANDWIDTH MANAGEMENT

Micom triples capacity of data/voice mux

BY MICHAEL CSENGER

Simi Valley, Calif.

Next month, Micom Communications Corp. will announce a new line of subrate data/voice multiplexers with three times the capacity of Micom's existing devices.

The company developed the Stadia DVI Hub to attract larger customers and to let current users expand their networks, said Ken Guy, Micom's vice president of corporate strategy and business development.

The Stadia has a total capacity of 1.2M bit/sec, divided among 12 slots for modules that support WAN, LAN, phone and individual end-user data ports.

Micom's current line of Marathon and NetRunner multiplexers carries data, voice and fax traffic over multiple low-speed leased lines running at up to 128K bit/sec each. The Micom products spare users monthly toll charges by bundling voice and fax traffic over leased lines that need to be installed for data anyway.

But Marathon and NetRunner WAN ports are limited to an aggregate throughput of 384K bit/sec, which has restricted the products' scalability, Guy said.

Stadia, with an aggregate bandwidth of 1.232M bit/sec, will serve as a central-site platform that is fully interoperable with Micom's earlier offerings.

Kitchen Etc. will save $240,000 in hardware costs by using Stadia, said Manus Fritsvold, director of MIS for the Hampton, N.H.-based retailer.

"Our plans for expanding to 30 stores without the Stadia would have required a Marathon 10K in each store" just to provide adequate wide-area connectivity, he said. With Stadia as a central-site box supporting the entire net, each store now requires only a Marathon 1K, saving the firm a quarter of a million dollars.

CELL RELAY

Micom's products use a proprietary cell relay technology called MicroBand ATM. By chopping all traffic into cells 25 bits long, interleaving them and prioritizing voice cells, Micom is able to carry traffic in an Asynchronous Transfer Mode-like fashion over leased lines ranging from 9.6K to 128K bit/sec in speed.

Micom will offer frame relay support early next year, Guy said. Standards-compliant ATM support will then follow, letting users connect Micom nodes with public ATM or frame relay services as needed. The muxes support just leased-line services now.

Stadia is the first of several planned higher end products from Micom, Guy said. Technical issues limit Stadia's total capacity to less than a full 1.544M bit/sec T-1, but another product due around the middle of next year will support T-1 links.

Shipping in November, the Stadia DVI Hub costs $9,950. A common configuration for a central site supporting a dozen remote offices would cost about $44,000.

©Micom: (805) 583-8600.

Micom mux comparison

Product	Marathon and NetRunner line	Stadia DVI Hub
Aggregate bandwidth	384K bit/sec	1.232M bit/sec
Maximum port configurations (not concurrent)		
WAN links	12	42
Data channels	41	153
Voice and fax channels	8	18
LAN connections	2	8

Bay Networks rolls out switched internet plan

BY JIM DUFFY

Waltham, Mass.

Bay Networks, Inc., the company formed from the merger of SynOptics Communications, Inc. and Wellfleet Communications, Inc., last week unveiled its blueprint for migrating users of shared-media LAN internetworks to switched virtual nets.

The firm also unveiled several products that play a role in the new architecture.

Called Bay Networks' Switched Internetworking Services (BaySIS), the blueprint applies to desktop access, LAN backbones, WAN backbones and remote sites. It defines three areas of focus: transport services, policy services and operation services.

Transport services include the technologies used to move data, video and voice traffic through an internetwork, such as routing, switching, wide-area networking and shared-media connectivity. Bay's philosophy with regard to transport services in switched internets is "switch where you can, route where you must," said Stephen Collins, director of Asynchronous Transfer Mode product marketing.

BaySIS supports virtual network routing, whereby a single centralized router performs routing between interconnected switched workgroups. The alternative would be to place routing at the workgroup switch, which Cisco Systems, Inc. espouses with its CiscoFusion architecture.

Bay unveiled two products for virtual net routing: an ATM interface that links Bay's Backbone Node router to its System 5000 hub; and an ATM switching engine for the System 5000.

The ATM interface for the Backbone Node router, available in the third quarter of 1995, is based on a Motorola, Inc. 68060 microprocessor. It features a 155M bit/sec Synchronous Optical Network interface and supports hundreds of active virtual circuits, Collins said.

The ATM switching engine module for the System 5000 hub, available in the second quarter of 1995, supports 2.5G bit/sec of bandwidth. As many as four of these modules can fit into the System 5000 for up to 10G bit/sec of bandwidth. The module switches cells between 10M and 100M bit/sec Ethernet, 4M and 16M bit/sec token-ring and ATM LANs. Pricing was not disclosed.

"We will drive routing services based on the application and not push users" toward a single vision of centralized route serving and distributed route caching, Collins said, referring to Cisco's CiscoFusion.

"BaySIS is going with the centralized router with the ATM feed into the ATM switch," said Melinda Le Baron, program director at Gartner Group, Inc. in Stamford, Conn. "You would have a centralized router that would do all of the routing between virtual LANs. There's no routing on the periphery."

Bay intends to eventually support routing at the periphery — specifically at the LAN backbone, Collins said — but a time frame was not disclosed.

The second major piece in the BaySIS strategy, policy services, is the company's scheme to let users define logical workgroups, net access restrictions and class of service. To this end, BaySIS will allow users to establish parameters for end-to-end network traffic management, remote office configuration and networkwide security, Collins said.

Lastly, operations services is how BaySIS intends to allow networkwide monitoring and control of network devices — including switches and remote office gear — physical segments, logical subnetwork groupings and WAN bandwidth. Bay announced two new products to aid in this effort.

One is Optivity/RM, software that combines Bay's Optivity management platform and Site Manager application for router configuration management. Optivity/RM, which runs on Unix workstations, provides router performance monitoring and status reporting, path determination and diagnostics, and configuration management.

The other is Enterprise Management View, a centralized console for managing enterprisewide switched internetworks. The Enterprise Management View software runs on Unix workstations and allows users to view networks by region, campus or office. It maps, configures, monitors and analyzes hubs, routers, switches, LANs, WANs and other resources, and collects and logs alarm and event data.

Optivity/RM is available now for $5,995. Enterprise Management View will be available in the first quarter of 1995. Pricing was not disclosed.

Another product announced last week is the Access Node Router Hub, a fixed-port hub that features 12 10Base-T Ethernet ports and either two synchronous WAN ports running at up to 2M bit/sec, or one synchronous and one ISDN Basic Rate Interface.

The Access Node Router Hub is available now for $3,345.

©Bay: (508) 670-8888; (408) 764-1180.

BaySIS instinct

Bay Networks, the company formed by the Wellfleet/SynOptics merger, last week rolled out its Bay Networks' Switched Internetworking Services (BaySIS) blueprint for helping users migrate from traditional shared-media LANs to switched virtual networks. Products introduced include a Backbone Node router ATM interface, an ATM switching module for the System 5000 hub, a low-end routing hub and two management offerings.

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Ontos set to object-enable relational DBMSs

BY KEVIN FOGARTY

Burlington, Mass.

Object database vendor Ontos, Inc. will announce next week an application development tool kit that will make it easier to store object-oriented data and applications in Sybase, Inc. relational databases.

Ontos' Virtual Information Architecture (VIA) is a set of tools designed to let relational databases serve as repositories for object-oriented applications.

A key component of VIA is the Object Integration Server (OIS), a database driver that can disassemble objects into components a relational database can digest. OIS also creates maps to those components so they can be used by applications.

While the first OIS works with Sybase SQL Server databases, future drivers will be for Microsoft Corp.'s SQL Server, Oracle Corp.'s Oracle7 and IBM's IMS, VSAM, IDMS and DB2 databases.

VIA initially supports applications written in object-oriented C++ or Ontos' Studio. Future versions will support Microsoft's Open Database Connectivity and Object Linking and Embedding technologies and Visual Basic tools, as well as IBM's Smalltalk and Powersoft Corp.'s PowerBuilder.

The main OIS software resides on the same server running the database software, though a runtime component must reside on clients running the applications being used.

The Ontos offering addresses relational databases' limited object-handling abilities, said Hugh Bishop, an analyst with Boston-based Aberdeen Group, Inc. While users like the speed and ease with which they can build applications using objects, it is difficult for them to use those applications with their installed databases, he said.

Relational databases can store objects but only by disassembling them. Objects stored in this way can only be accessed through hand-drawn maps of a database's structure showing where the pieces are. VIA and OIS automate this process.

Other vendors of what Bishop calls "object/relational enabler tools" include Hewlett-Packard Co., Easel Corp. and NeXT Computer, Inc. But they have not designed their products to work as cooperatively with relational databases as Ontos has, Bishop said.

Pricing for VIA starts at $70,000, which includes development and runtime versions, consulting and training, as well as the Sybase-specific OIS.

©Ontos: (617) 272-7110.

Allied offers low-cost E-net switch

BY MICHAEL CSENGER

Bothell, Wash.

Allied Telesyn International Corp. plans to drive pricing in the Ethernet switching/ATM access market down to commodity levels sooner than most people think is possible.

The company, formerly known as Allied Telesis, Inc., last week introduced CentreCom 4016, a 16-port Ethernet switch with a single pipe out the back to an Asynchronous Transfer Mode switch. Allied is positioning CentreCom as a low-cost way for customers to bring higher bandwidth to the desktop and give LAN users access to emerging ATM backbones.

Allied has quietly built a $180 million-a-year business in the Ethernet hub and repeater market, and is thriving on profit margins that are too thin for other competitors, said Allied President Anthony Russo.

> **"The key is being the company that drives the curve down while everyone else is pressured to keep margins up."**

According to Russo, LAN switches, while still new today, are based on simple technology that could be commoditized in 12 to 18 months. "The key is being the company that drives the curve down while everyone else is still pressured to keep margins up in order to pay for their overhead," he said.

Like competing switch vendors — SynOptics Communications, Inc. (now Bay Networks, Inc.), Kalpana, Inc., AmberWave, Inc. and Agile Networks, Inc., among others — Allied says its switch lets customers gain the benefits of dedicated bandwidth without having to throw away huge investments in current LAN equipment.

The 4016's 16 Ethernet ports, each at 10M bit/sec, can be linked to high-performance workstations or fanned out to traditional Ethernet hubs supporting shared-media segments. Using a 100M or 155M bit/sec ATM pipe to link these segments and workstations to an ATM backbone improves performance at less cost than traditional bridges or routers can.

The 4016 is entirely standards-based, offering no proprietary value-added features or functionality. "You don't need it at this level of the net," Russo said.

More-involved ATM networking functions, such as virtual LANs or LAN emulation, are left for the ATM switch itself to handle. This bare-bones approach lets Allied price its switch at about $770 per Ethernet port.

"They sound to me like people with a big hat and no cattle," said Todd Dagres, vice president at The Robinson-Humphrey Company, Inc., a securities trading firm in Atlanta. By the first quarter of next year, when Allied plans on delivering its switch, at least a half-dozen other vendors will offer similar products, ranging from $500 to $1,000 per port.

"They're in the mid-range, right where other vendors will start differentiating their products with greater functionality," Dagres said.

Differentiation will include virtual LAN capabilities, along with monitoring, analysis and remote management features under a unified management system.

But Russo insists switches will quickly resemble stackable hubs. The 4016 will sell itself on price and simplicity. "You open a box, unpack it and plug it in without calling on technical support," he said.

"Famous last words," said Jennifer Pigg, director of data communications at The Yankee Group, a Boston-based consultancy. "God help the user who thinks he can just plug anything in.

"If you're selling network giblets that are standards-based and interoperable with higher level gear, then [Allied is] right," she said. "But network managers want somebody to give them a complete solution, and the value-add in commodity markets is being decided more and more by distribution channels."

Russo said Allied's distribution channels are up to snuff, having handled $180 million worth of equipment last year. Some unnamed partners will also market the switch as part of an overall solution.

Allied's 4016 has already passed interoperability tests with Fore Systems, Inc.'s ASX line of ATM switches, and Allied will continue testing with other switches, as well, Russo said.

Slated for delivery in first-quarter 1995, the CentreCom 4016 will cost $12,315 fully configured.

©Allied: (800) 424-4284.

Comments?

See "How to reach us" on the back page.

UB calls upon agent to investigate hub problems

BY JIM DUFFY

Santa Clara, Calif.

UB Networks, Inc. last week unveiled what it believes is the next wave in agent technology for managing switched internetworks.

The company unleashed Access/Empower, a hardware module and software for UB's Access/One hubs that sets and monitors performance thresholds, analyzes traffic and automatically responds to management problems without human intervention. Access/Empower handles tasks usually performed by management platforms, such as Hewlett-Packard Co.'s OpenView or SunSoft, Inc.'s SunNet Manager.

Current Simple Network Management Protocol agents are limited in capability, collecting data for SNMP platforms when they are polled by a management console or through SNMP traps. They rely on commands from those platforms to take corrective measures.

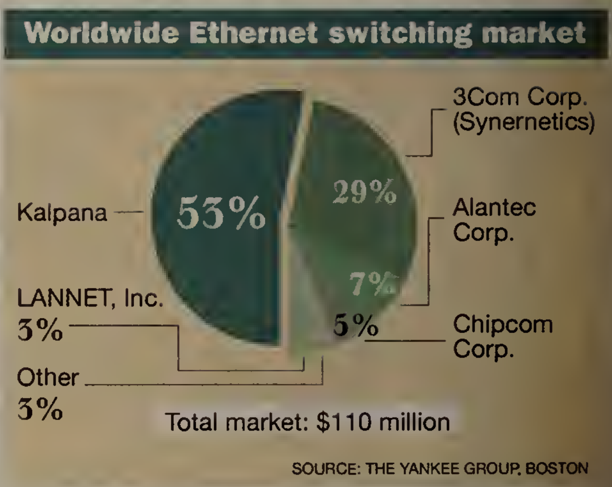
Access/Empower makes UB hubs

See **Investigate**, *page 79*

Cisco

Continued from page 1

Worldwide Ethernet switching market



Total market: $110 million

SOURCE: THE YANKEE GROUP, BOSTON

buy Kalpana for about $150 million. IBM now resells Kalpana Ethernet switches and has been working with the vendor for two years to develop a token-ring switch to be sold under IBM's logo.

To meet its first-half 1995 shipping deadline for the token-ring switches, IBM appears ready to rely on internetworking rival Cisco for the products. The alternatives would be for IBM itself to complete work on the switch it was working on with Kalpana or start from scratch with another switch vendor, two scenarios that could delay the product's shipment.

"The real reason [Cisco acquired Kalpana] was because of the token-ring switch products and the implications of IBM having to work with Cisco in token-ring switching," said Val Sribar, senior research analyst at META Group, Inc. in Westport, Conn.

COMPLEMENTARY DEAL

From a product distribution perspective, Cisco officials said the acquisition is complementary.

"This acquisition signals Cisco's rapid expansion of its LAN switching strategy into [what] we think will be a multibillion [dollar] market over the next few years," said Barry Eggers, Cisco's business development manager.

But from a product positioning standpoint, some observers see the purchase of Kalpana and its EtherSwitch offerings as redundant. Cisco already has its Catalyst Ethernet-to-Fiber Distributed Data Interface switch obtained though the acquisition of Crescendo Communications, Inc. last year.

Cisco said Catalyst will fill the role of a departmental switch-of-switches or switch-of-hubs to connect workgroups to FDDI backbones, instead of the workgroup switch function originally envisioned for the device. That role will now be filled by the Kalpana products, which will eventually be developed.

"I thought that the stuff they were working on with regard to the Catalyst products would've given them a pretty adequate Ethernet switch," said Coyne Gibson, information technology manager at Convex Computer Corp. in Richardson, Texas. "If it gets Cisco to market with a cost-effective Ethernet switch [through the Kalpana deal, however], there's probably a benefit."

Cisco and Kalpana, which initially will operate as an independent subsidiary, will develop a joint product roadmap under which the EtherSwitch and Catalyst products will evolve into a family of cut-through and store-and-forward LAN switches, Eggers said.

Sribar said Cisco's product positioning in this area "is going to be somewhat awkward. There's a bit of a challenge there, which is why I don't think this deal was done for the product."

But Cisco will fill at least one definite product-line gap — token-ring switching — by acquiring Kalpana. Cisco will also have the opportunity to help IBM fill that same hole in its product line. "We are absolutely going to continue to support that effort between Kalpana and IBM," Eggers said.

IBM and Cisco have had an adversarial relationship at times, underscored by Cisco's public bashing of IBM's Advanced Peer-to-Peer Networking and encroachment on front-end processor turf with a channel-attached router. But IBM seems ready to embrace Cisco. "We have existing agreements with Kalpana, and we'll continue with those," an IBM spokesman said.

Staff Writer Margaret Dornbush contributed to this story.

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Upstart marries multimedia to LANs and WANs

BY KEVIN FOGARTY

Palo Alto, Calif.

Start-up Emotion, Inc. this week will announce availability of a collaborative computing tool that lets users distribute and annotate multimedia files across a network.

The product, Creative Partner, will support multimedia files created for Oracle Corp.'s Media Server and any other application that uses standard video compression and viewing techniques, said Gerry Machi, president and chief executive officer of Emotion.

The core of Creative Partner is a software distribution engine that monitors and manages software delivery across LANs or WANs. It can distribute any type of file from a local hard disk or a server to any other network node running Creative Partner.

Users can receive video clips from coworkers and view full-motion video continually or one frame at a time on their desktops. They can then annotate individual frames using drawing, text and audio tools.

The first version of Creative Partner is a niche product for people who have to work collaboratively on full-motion video, but it does give users the ability to distribute video across their networks at a fairly low cost, said Cheryl Ball, analyst at the Business Research Group consultancy in Newton, Mass.

It runs only on Apple Computer, Inc. Macintoshes and makes only peer-to-peer connections, limiting its usefulness.

"But anything in the multimedia arena today is 'nichey,'" Ball said.

What is more valuable than the ability to download updates of sales videos to kiosks is video electronic mail, the ability to annotate multimedia files and transfer them among members of a workgroup, Ball said.

Creative Partner can read and display clips compressed with Motion Picture Experts Group (MPEG), Joint Photographic Experts Group and other video compression techniques. Emotion also sells an MPEG compression card for the Macintosh, which requires such a card to compress and read MPEG files.

An updated version of Creative Partner, due during the first half of next year, will add Microsoft Corp. Windows clients, a server version with advanced distribution management, and the ability to view and annotate still graphics and scanned images.

That will expand the product's appeal by letting users share and add comments to multimedia files other than films, such as accident reports or loan requests, Machi said.

The initial release of the application uses the AppleTalk user directory to locate all copies of Creative Partner running on the network and puts their addresses in a local address book, which also includes modem numbers and other data for remote connectivity.

Before a file is downloaded, Creative Partner queries the computer that is to receive the file to be sure there is sufficient disk space and no identical copies of the file to be downloaded.

It tracks the distribution and can restart the process if the downloading process is interrupted.

Creative Partner will reestablish a connection and send only the part of the file that was not sent, Machi said.

Users can save their annotations as a separate file and circulate that file to colleagues who have copies of the clip.

Creative Partner will sell for $7,500 for a five-user pack.

ⒸEmotion: (415) 812-9000.

INTERNET *tip*

BY ADAM GAFFIN

One in a series of occasional tips on Internet-based information services.

Network security

Great Circle Associates of Mountain View, Calif., has built a World-Wide Web (WWW) service related to Internet fire walls. Resources include:

- ✓ **Archives of the fire wall mailing list**
- ✓ **Answers to frequently asked fire wall questions**
- ✓ **Lists of fire wall vendors**

To access:
Point your WWW browser at
http://www.greatcircle.com/firewalls.

Gaffin can be reached via the Internet at agaffin@world.std.com.

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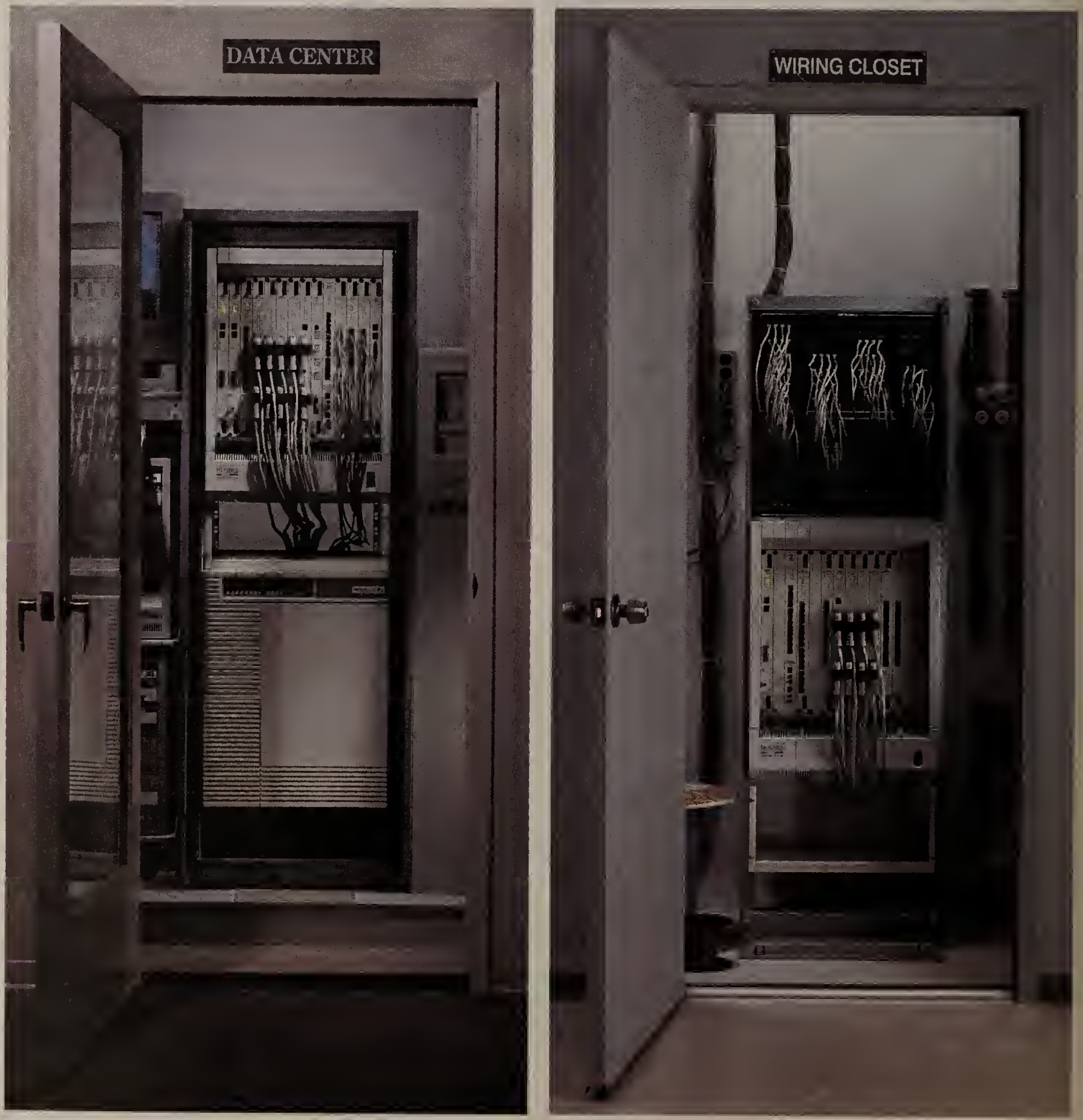

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DaVinci enhances eMail with rules, bulletin boards

BY ADAM GAFFIN

Austin, Texas

DaVinci Systems Corp. this week launches a new version of its eMail with support for Novell, Inc.'s Global Message Handling Service (MHS) and rules-based filters that help users sort incoming mail.

Also new in Version 3.0 are bulletin boards, support for Microsoft Corp.'s Simple Messaging Application Program Interface (MAPI) and enhanced directory synchronization services, as well as greater support for remote and mobile users.

The release marks the first major upgrade to DaVinci eMail since ON Technology Corp. purchased DaVinci in June. That purchase was part of a wave of electronic mail mergers this year — along with Banyan Systems, Inc.'s purchase of Beyond, Inc. and Novell's acquisition of WordPerfect Corp.

The DaVinci eMail additions, particularly the optional rules package, help bring the product up to snuff with Lotus Development Corp.'s market-leading cc:Mail, said David Ferris, president of Ferris Networks, a San Francisco E-mail consulting firm.

"This is all good stuff," he said.

With the optional rules package, users will be able to establish commands for how to handle incoming mail — for example, messages from a person's boss could be filed automatically in a specific folder. The rules will also let Windows users launch desktop applications via Windows' Dynamic Data Exchange.

The software also lets administrators create enterprise rules for message handling — for example, rules on when to delete old messages.

Scott Barker, who oversees a 7,000-node DaVinci eMail network at the University of North Carolina at Chapel Hill, said Version 3.0 worked fine in beta tests there earlier this year. Barker said the rules capability, in particular, will prove useful to users by reducing the time they have to spend sorting mail.

Support for Simple MAPI will let users integrate desktop Windows applications with eMail so they will be able to do such things as mail a spreadsheet file from within that application.

What's more, Version 3.0 offers new remote connectivity features that include the ability to route mail from a user's main desktop to a remote site and support for Novell's Remote MHS.

The new version's directory synchronization enhancements should cut the time for that chore.

DaVinci eMail comes in Windows, DOS and Macintosh clients. The new version will ship by December. Pricing starts at $590 for a 10-user E-mail license and $625 for a 50-user license for the rules add-on.

©DaVinci: (800) 362-4549.

Connectware to cruise into messaging mart

Connectware, a subsidiary of electrical connector maker AMP Co., last week said it is readying message handling software that integrates E-mail, fax and voice messages under a common user interface.

Cruiser, due to ship in the first quarter of next year, will feature a file-server mail system that incorporates group calendaring. Users will be able to update a "status server" about their availability and the best way to reach them at a given time.

A rules-based electronic mail filter will let users automatically route incoming messages into folders and create "chains" of related messages.

The software supports the Messaging Application Programming Interface, so users could employ Cruiser clients as alternate front ends to Microsoft Corp.'s Microsoft Mail while using existing Microsoft Mail post offices.

Connectware was founded a year ago. Since then, it has acquired a series of small companies specializing in the hardware and software technologies needed to build a multimedia, messaging and imaging system atop Asynchronous Transfer Mode networks.

Nancy Jameson, an analyst with the Dataquest, Inc. consultancy in San Jose, Calif., said Connectware could be carving out a lucrative niche if it can offer companies an alternative to the integrated messaging platforms being developed by the telephone companies, such as AT&T's Intuity multimedia messaging platform.

Connectware: (214) 907-1093.

BY ADAM GAFFIN

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*Pricing and other chart information was compiled from multiple industry resources as of 3/94

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Circle Reader Service #44

Novell to step out with new Tuxedo TP monitor release

BY BARB COLE

Paris

The next version of Novell, Inc.'s Tuxedo transaction processing (TP) monitor — scheduled to roll out next month — will feature new capabilities for managing distributed applications, including ties to SNMP-based management systems.

Tuxedo 5.0 will also let users exploit the directory and security services of the Open Software Foundation, Inc.'s Distributed Computing Environment (DCE) without using DCE remote procedure calls (RPC). In addition, users will be able to recompile DCE applications to run on Tuxedo.

According to a Tuxedo 5.0 beta tester, Novell will also offer the software on Windows NT. It currently runs on Unix only.

Simple Network Management Protocol support and DCE compliance are part of a broad push by Novell to make Tuxedo and Tuxedo-based applications easier to integrate with existing systems. Also in that vein, Novell last week rolled out Tuxedo OSI TP gateway, which lets Tuxedo work with other TP monitors that support the Open Systems Interconnection TP protocol.

OSI TP is a TCP/IP-based transaction processing protocol developed by the International Standards Organization. Via OSI TP, Tuxedo will be able to share TP work with several mainframe-based TP monitors, including those from firms such as Unisys Corp., Groupe Bull SA and Siemens Nixdorf Informationssysteme AG.

Novell said these links to mainframe systems will be useful to companies that are downsizing to Unix but wish to keep some applications on the mainframe.

"I have been waiting for this for a long time. We use Tuxedo in a banking-on-demand application, and we've been unable to connect Tuxedo to a TP system on a Unisys mainframe," said Philippe Duhamel, chief information officer at Credit A' L' industrie, a Brussels, Belgium-based bank.

Looking spiffy

Tuxedo 5.0 features

- A messaging system to link Tuxedo to SNMP-based management systems.
- Windows NT support.
- Ability to use DCE file and security services without using DCE remote procedure calls.
- Support for recompiled DCE applications.

Duhamel said the only way the bank could save changes across the two systems was to perform two separate operations. Now it will be able to save transactions once and share that information between Tuxedo and the mainframe system via OSI TP.

Analysts said OSI TP support is a good move but warned that the standard lacks broad support. For example, IBM will not comment on whether it will support OSI TP in its CICS/6000 and Encina TP monitors, and AT&T Global Information Solutions said it has no plans to support the protocol in its Top End product.

"People haven't done too much with heterogeneous transactions yet. This standard could change that over time if other vendors get involved," said Joe Gottlieb, vice president at META Group, Inc. in Stamford, Conn.

CHANGING ROLES

SNMP support helps position Tuxedo for a new role. In legacy systems, TP monitors provided an invaluable service for host databases by helping to manage the work load. But today's relational databases can handle much of that work for themselves.

As a result, TP monitors are being retread as "traffic cops" that can monitor and optimize client/server application performance, according to Joe Menard, vice president and general manager of Novell's Tuxedo Systems Division.

> **"People haven't done too much with heterogeneous transactions yet. This standard could change that."**

SNMP support is critical for helping users manage Tuxedo-based applications centrally.

DCE, too, provides a centralized way for administrators to develop and manage applications. Novell rolled out support for DCE in August, but at that time, users were required to take an all-or-nothing approach if they wanted to use DCE services from within Tuxedo. In Tuxedo 5.0, users will not be required to use DCE RPCs, which have been criticized for being too slow, in order to exploit DCE security and file services.

Available now, Tuxedo OSI TP costs $15,000 per server.

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ENTERPRISE INTERNETS

Data Network Architectures, Standards, Equipment and Management

Cost of computing

Mainframe	PC LAN
$950 to $6,146 annually per user	$4,191 to $7,750 annually per user
$.004 to $.07 per transaction	$.16 to $.66 per transaction

SOURCE: INTERNATIONAL TECHNOLOGY GROUP, MOUNTAIN VIEW, CALIF.

'Mainframe' is no longer a dirty word

BY MICHAEL COONEY

Poughkeepsie, N.Y.

Optimism tempered by reality. That's one way to describe the industry's relationship with the IBM mainframe right now.

IBM is billing its new generation of mainframes as the server platform of choice, but the reality is users are also looking at Hewlett-Packard Co.'s HP 9000 or servers from NetFRAME Systems, Inc. and others.

Still, the word is slowly getting out that mainframes are no longer politically incorrect and can indeed function as servers for many users.

"The goal a couple years ago was to get everything and everyone off of the mainframe, but that is no longer the case," said Lionel Geltman, assistant vice president with the Nomura Research Institute America, Inc. in New York. "A lot of users who went off the mainframe to do client/server work are finding themselves coming back to the mainframe for the reliability and capacity that is unique to the mainframe."

Meanwhile, IBM is making some bold predictions. "We think that by the end of 1995 we will be at the

See **Mainframe**, *page 17*

Calif. cuts red tape with video contract

Agencies gain buying flexibility; travel budgets earmarked for videoconferencing.

BY ELLEN MESSMER

Los Angeles

THE ALMIGHTY DOLLAR

With the goal of streamlining communications between employees at the state, county and local levels, California has set up a master contract that lets any agency on the statewide network acquire videoconferencing equipment.

The contract's flexibility allows agencies new to videoconferencing to try products prior to purchase and makes the technology affordable — via leasing or renting — to those agencies without large budgets.

With the ability to buy what they need off a master contract, individual agencies do not have to spend months negotiating contracts themselves.

As part of its strategy to encourage state employees to use videoconferencing in lieu of travel, California is allowing 25% of allotted travel budgets to be applied toward equipment installation and services. California government agencies spend about $140 million per year on travel.

The master contract, awarded by California's Department of General Services last spring to Compression Labs, Inc. (CLI), Pacific Bell and systems integrator TeleImages, Inc., lets agencies decide whether to purchase or lease standard-based video group systems.

Agencies can also pick among network services, such as ISDN and digital private lines, for tying into the state's CalNet backbone network to conduct videoconferences, said Don Halberg, the state's general manager of information technology.

To date, nine state agencies — the California Department of Transportation foremost among them — have bought $3.4 million in equipment and services off the master contract. At the Department of Transportation, more than 360 people per month no longer have to travel to remote sites for meetings, with cost savings estimated at $70,000 per month, Halberg noted.

But convincing agencies to change old habits in favor of an unknown technology has not been easy. To help win video proponents, California's General Services agency routinely demonstrates conferencing and graphics sharing at two sites where a dual-monitor CLI Gallery System room system and six ISDN lines support up to 758K bit/sec for top picture quality.

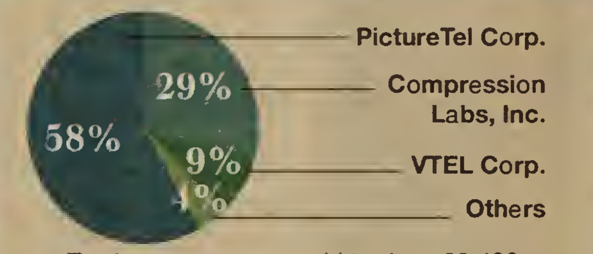
General Services also rents out its videoconferencing rooms for $75 per hour. The State Bar Association and northern California's College of the Redwoods have been among those organizations taking advantage of the offer.

General Services would like to see the rental practice adopted statewide as agencies set up videoconferencing rooms. Renting would further the goal of getting more agencies to use videoconferencing and help defray video costs, as well.

To encourage sharing of rooms, General Services is seeking to establish a statewide videoconferencing reservation system. Products for managing video reservations are not as plentiful as users would like; however, a product called Convene from Emeryville, Calif.-based Edison West, Inc. is being evaluated by the state.

Video showdown

Market share for group videoconferencing systems.



Total group systems sold to date: 22,400

SOURCE: THE YANKEE GROUP, BOSTON
GRAPHIC BY SUSAN J. CHAMPENY

ERI targets integrated access market

BY JIM DUFFY

Southampton, Pa.

Eastern Research, Inc. (ERI) last week said it is developing a line of network access devices, called DNX, that integrate routing with circuit, packet and cell switching in a single modular chassis.

At the same time, ERI unveiled the DNS3600 T-1 Digital Network Multiplexer, a low-end modular multiplexer that can serve as both a data service unit/channel service unit and an access multiplexer.

The DNX will be offered in four- and 11-slot configurations. Each features a 256M bit/sec time-division multiplexed (TDM) bus and a 1G bit/sec Asynchronous Transfer Mode bus, said Joseph DeCarolis, EDI general manager.

Modules for the DNX will include single-, dual- and quad-port T-1 interfaces, single-port Ethernet cards, a routing module for TCP/IP and IPX traffic, and two- and four-wire analog voice cards, DeCarolis said. ERI also plans to add single-port T-3 and 50M bit/sec High Speed Serial Interface cards to the DNX over time, he said.

The DNX will support frame relay interfaces running at up to T-1 speed and ISDN Primary Rate Interfaces. Inverse multiplexing is not planned for the device, DeCarolis said.

With the DNX, ERI will go up against Premisys Communications, Inc. and Telco Systems, Inc. Premisys' Integrated Multiple Access Communications Server (IMACS) Model 800 sports 16 slots for voice, data and wide-area interface modules, and 20 parallel TDM buses with an aggregate bandwidth of 80M bit/sec. It costs $10,000 (*NW,* Jan. 18, 1993, page 13).

Telco Systems' Access60 supports a 64M bit/sec TDM bus and 15 slots, and is priced from $6,500 to $20,000 (*NW,* March 7, page 9).

The IMACS/800 and the Access60 do not support LAN routing, but they do support inverse muxing.

The DNX is slated to ship in first-quarter 1995. Pricing will start around $6,000, DeCarolis said.

Meanwhile, the DNS3600 features a built-in T-1 CSU, two high-speed synchronous interfaces and a DSX-1 digital private branch exchange interface that enables data and a PBX or channel bank to share a T-1 circuit to the carrier central office.

The DNS3600 also sports two slots for housing dual-port T-1 cards, a five-channel subrate data card and a dual-channel voice card.

The DNS3600 costs $2,995 and is available now.

©ERI: (215) 364-7955.

ERI addresses network access

Product	DNX	DNS3600
Description	Access devices that combine routing with circuit, packet and cell switching	Low-end mux with built-in DSU/CSU
Pricing	From about $6,000	$2,995
Availability	1Q 1995	Now

BRIEFS

An alliance of vendors and users last week formed an international group to advance the **High-Speed Parallel Interface (HIPPI)** standard. Running at up to 1.6G bit/sec, HIPPI can interwork with LAN and WAN protocols, including TCP/IP and Asynchronous Transfer Mode, and is used mainly for high-speed applications such as parallel computing or molecular modeling. The **HIPPI Networking Forum** can be reached at (800) 974-4774.

Cascade Communications Corp. last week announced software and hardware enhancements that support a new feature — Fault Tolerant Frame Relay — on its B-STDX 9000 wide-area switch. Designed for mission-critical Systems Network Architecture requirements, the new feature provides automatic dial backup capabilities using ISDN Primary Rate Interface connections. Fault Tolerant Frame Relay will be fully available in February 1995 and will be offered as standard operating software.

Cascade: (508) 692-2600.

The **National Security Agency (NSA)** has changed the name of the **Tessera** PCMCIA encryption card the Department of Defense will use to **Fortezza** at the request of California electronics firm Tessera, Inc. The name change marks the second time the NSA has goofed on names — the controversial Clipper Chip encryption card also violates a registered trademark.

Cray Communications last week announced a 56K bit/sec **data service unit/channel service unit (DSU/CSU)** that can be managed over a frame relay network.

Known as the DCP4856IP, the DSU/CSU features an embedded **Simple Network Management Protocol** agent and Management Information Base that enables users to cull management data and set parameters on the DSU/CSU from a central SNMP console. It is available now and costs $995.

Cray: (301) 317-7710.

INTERNETWORKING MONITOR

by Scott Bradner

Remembrances of things past

Long, long ago, in a hype not far enough away, some advocates claimed nuclear power would be "too cheap to measure" — the proverbial free lunch. There turned out to be a few implementation details between the promise and the reality.

In the same vein, here is a quote from a thread on the com-priv mailing list last week. "The spectrum and bandwidth is, or will be, so abundant it will almost be more expensive to charge for it than to give it away." The poster went on to quote George Gilder's *Life After Television*.

"The limitations of the air, and even of the coaxial copper wires that carry cable television, have given way to the unlimited bandwidth of lasers and glass. 2G bytes a second can be transmitted in a second [sic] down fiber-optic lines. Fiber-optic glass wires the width of a human hair could potentially bear billions or even trillions of characters of information per second."

Now I will admit to not having read this work so I do not know to what degree the quote has been taken out of context, but it does seem a bit of a stretch to go from "fiber optics can carry a lot of data real fast" to imply that the cost to the user for the transport of data will tend toward zero. There is this little detail of installation cost.

I heard an estimate a while back that it would cost more than $200 billion to wire every house in the U.S. with fiber, and that's taking into account economies of scale. (How come people talk about "wiring" with fiber? I guess it's like talking about "dialing" a telephone.)

So let's see, $200 billion divided by about 100 million homes means about $2,000 per house. Amortize that over some number of years, but add in the cost of money and maintenance, and it might come out to $120 per year or $10 per month. Hey, that's not too bad.

But wait, not everyone will be using the fiber, so let's figure in a fudge factor for the idle fibers that still have to be paid for, pushing it to about $13 per month. Still not too bad.

Oops, I forgot someone might want to actually use the fiber, so we'll need some electronics to go with it. In my experience, this costs around half the cost of the fiber itself, with maintenance and management another half, so we will have to double the rate to about $26 per month. OK, I can live with that.

Darn! This is the U.S. We can't amortize over 20 years — Wall Street would never stand for it. And what if some direct broadcast satellite technology came along and obsoleted all of this investment? We better cut that to about seven years.

Hmm, now what does that do to the cost? The $12 becomes at least three times that. Come to think of it, you can't amortize the equipment over more than three or four years at the outside, so we will have to up the return on that part. Now we're up to $70 or $75 per month for the connectivity.

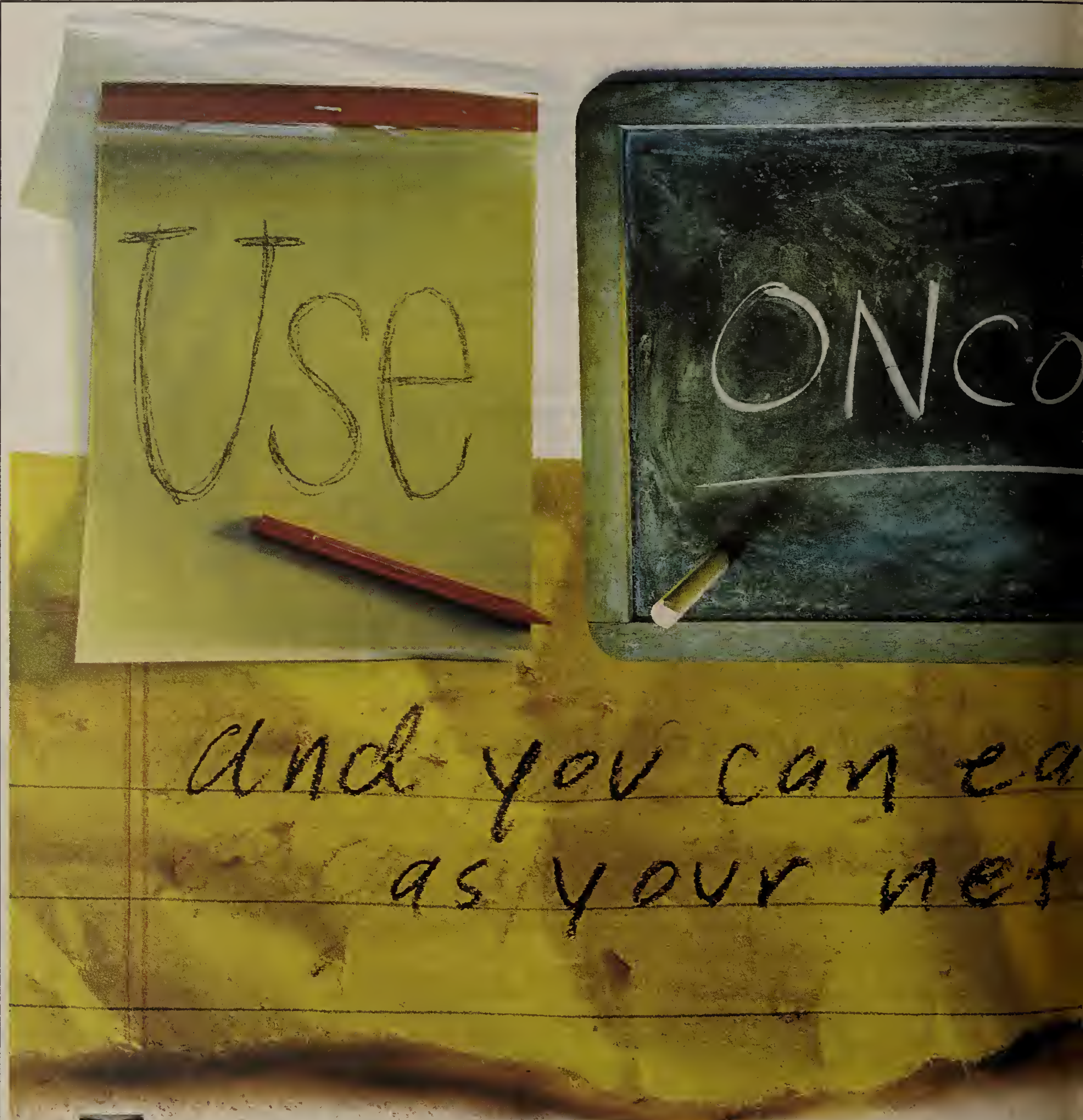
Next we have to add the cost of the services that the user subscribes to. I've read that the average cable TV subscriber gets 2.5 or so "Premium" channels. (I put Premium in quotes because that is very much in the mind of the beholder.)

That gives a final cost of $90 to $100 per month — a bit steep. I guess not everyone would be willing to pay that, so the penetration would be less, which would reduce the economies of scale, so the individual cost would go up. Do I see a catch-22 here? Not exact calculations but close enough for column work.

So much for the free bits. The thought was fun while it lasted. It's always nice to step back to the fairy tales of one's childhood. That reminds me of ATM, but that is a story for another night.

Disclaimer: Although Harvard knows full well from recent experience that there is a substantial cost to fiber-based network installation, the above are all my miscalculations.

➜ Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu.



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U.N. global trading system is close to becoming a reality

BY JEFF PHILLIPS

Columbus, Ohio

A United Nations initiative aimed at giving small and midsize companies improved access to international markets is poised for takeoff in countries spanning the globe.

Dubbed Trade Point, the initiative involves the establishment of trading centers in each country that offer database and electronic data interchange services, videoconferencing, credit reports, tutorials and an on-line electronic catalogue — all geared toward bringing together vendors and buyers around the world.

As of October, the initiative comprised 53 such trade points in varying degrees of development; 28 are fully operational, including Trade Point USA. About 100 trade points are expected to be on-line by early 1995, and all 185 U.N. member countries should be tied in by the end of next year, it was announced at the recent U.N. World Summit on Trade Efficiency here.

Trade Point USA, based here, has tested the concept with 2,600 Ohio companies since 1992 and will roll out its services nationally in January.

The rollout couldn't come sooner for Worthington Industries, Inc. The specialty steel and plastics manufacturer based here has sub-

See **Trading system**, *page 17*

TGV boosts security in TCP/IP nets

BY JIM DUFFY

Santa Cruz, Calif.

TGV, Inc. last week announced client/server-based software that is intended to make TCP/IP networks more secure.

Called Secure/IP, the software's server component runs on Digital Equipment Corp. VAX and Alpha systems that also run TGV's MultiNet TCP/IP software. The client package operates on Windows workstations running TGV's MultiNet for Windows product.

Secure/IP controls user access and authentication in MultiNet-based TCP/IP networks. The software prevents unauthorized access to networked resources through the use of hardware "tokens" that issue onetime passwords to users that are discarded after they are used.

Typical passwords can be captured and used for unauthorized net access, TGV said. Since they are issued on a onetime use basis and employ a personal indentifier — much like the personal identification numbers for automated teller machine transactions — token-based passwords are useless if captured by hackers or other net intruders.

Token representation

TGV's new Secure/IP software works with these security tokens:

- **Bellcore's S/KEY**
- **Digital Pathway's SecureNet**
- **Security Dynamics' SecurID**

Secure/IP supports a variety of tokens, allowing users to choose the one that best meets their needs (see graphic).

When a MultiNet for Windows user logs on to a MultiNet-based TCP/IP net, Secure/IP requests that user's personal identification code. If the code issued is correct, the software then requests a onetime password from the token, and the logon occurs.

MultiNet already supports Kerberos authentication, which is considered the industry-standard security algorithm for user access control. Though adequate for "bounded" networks that are confined to a customer premise, Kerberos is not particularly well-suited to networks that scale beyond the customer premise, said Craig Conway, president and chief executive officer of TGV.

Analysts agreed.

"It's not viable in a large public net implementation, like the Internet," said Jim Harrison, vice president of global networking strategies at META Group, Inc. in Westport, Conn. "Kerberos requires there be a central repository of encryption keys, and when you get into the issue of who will be allowed to manage and maintain this central repository of encryption keys for all users on the Internet, you very quickly start to see that it's probably just not a tenable solution for public net alternatives."

Secure/IP, by contrast, is targeted at applications that use WANs, dial-up links and Internet connections where electronic eavesdropping is prevalent.

Secure/IP for VAX and Alpha processors ranges in price from $1,000 to $12,000. The client software will be included with MultiNet for Windows. Secure/IP will ship by year end.

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Trading system

Continued from page 16

scribed to Trade Point USA since its inception in 1992, using it to advertise its propane cylinders, among other things.

"Trade points will make what can be a convoluted process simple," said Worthington spokesman Dennis Minshall. "It seems unusual today, but tomorrow it will be another [common] tool to sell your stuff."

The U.N. program's overall thrust is to connect international vendors and buyers via telecommunications links, the Internet, and satellite networks to negotiate and close deals.

"Future commerce will be done over the Internet, and this is what the trade points are all about," said Dennis Geraghty, president of Greyden Press, a 4-year-old digital printing and publishing company based here. "I don't think there's any other vehicle for a small business to get their messages out without spending obscene amounts of money."

A key benefit of the trade point system is that the technology permits firms to track who views product brochures, or better, what products are not getting a response, Minshall said.

"Right now, a sales person can travel to a country and hand out brochures, but there's no efficient way of tracking how many hands that piece of information may touch," he said.

Production and subscription costs for participating in the trade point network range from $500 to $1,000 a year, depending on the size of a subscriber firm.

Trade Point USA is working with partner companies to develop additional products and services. Partners include Digital, IBM/Advantis and Bankers Association for Foreign Trade, among others.

Also, Trade Point USA sponsor Novell, Inc. is working with AT&T to create a private global Internet system that will permit trading partners to negotiate confidentially after contact is made over public lines, said Rohon Champion, vice president of strategy for Novell.

Novell is also developing multimedia features such as voice activation to make the system simpler and broaden its appeal,he said.

A catalog of Trade Point USA's services can be accessed on the Internet using Mosaic at http://opus.natp.iftea.com/natp.html.

➡ Phillips is a free-lance writer based in Columbus, Ohio.

NETWORK WORLD TECHNICAL SEMINARS

The world of global networking, often referred to as Cyberspace, is under construction. The Internet, one of the primary building blocks on the road to cyberspace communication, offers companies of all sizes, in all markets, the opportunity to stake a claim in the globally networked future.

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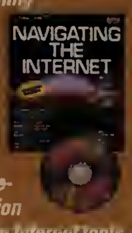

Mainframe

Continued from page 14

same cost level of any of the alternative mainframe providers and be able to compete in places we couldn't before," said Charles Lickel, director of IBM's Platform and Solutions Management Group. "Any other server platforms, in terms of bandwidth, storage capacity and communications capabilities, have to grow up to be what the mainframe is already."

In recent months, IBM's Large Scale Computing Division has made many long-term commitments aimed at making the mainframe more client/server-oriented.

For example, IBM already supports the TCP/IP environment across its entire line of processors and will soon ship OpenEdition for MVS, a Distributed Computing Environment-compliant platform that will enable users to develop distributed, cooperative processing applications on the venerable MVS operating system. It will also run Unix applications.

And IBM has promised to deliver early next year an adapter that will link token-ring, Ethernet and Fiber Distributed Data Interface LANs directly to IBM System/390 mainframes, obviating the need for any type of gateway device (*NW*, Oct. 24, page 1).

"With the TCP/IP support, we have already been able to keep our host involved in our client/server environment," said Guy Paterson, director of systems and telecommunications for the Saskatoon District Health Board in Saskatchewan, Canada. "We plan to have a mixed bag of servers for the foreseeable future."

There is no incontrovertible evidence that users are putting new mainframes to work in client/server environments, but it is clear they are buying them in large numbers. IBM recently reported that its quarterly mainframe revenue increased for the first time since the summer of 1992. It also said it will take until the end of first-quarter 1995 to fill the backlog of new mainframe orders.

A report from the META Group, Inc. consultancy in Westport, Conn., says that, particularly in the last quarter, IBM's large and midsize systems have benefited from early adopters who are eager to buy new technology first. The key will be whether that demand is sustainable, the report says.

Some users were skeptical, as well.

"Obviously, IBM and its users have a boatload of money invested in mainframe systems and applications, so IBM has to make the mainframe compete in the new client/server world or die," said one IBM mainframe user who requested anonymity. "The reality is IBM hasn't convinced me these new processors and their accompanying software will ultimately be more cost-effective than the older mainframes, so we may look elsewhere." ◻

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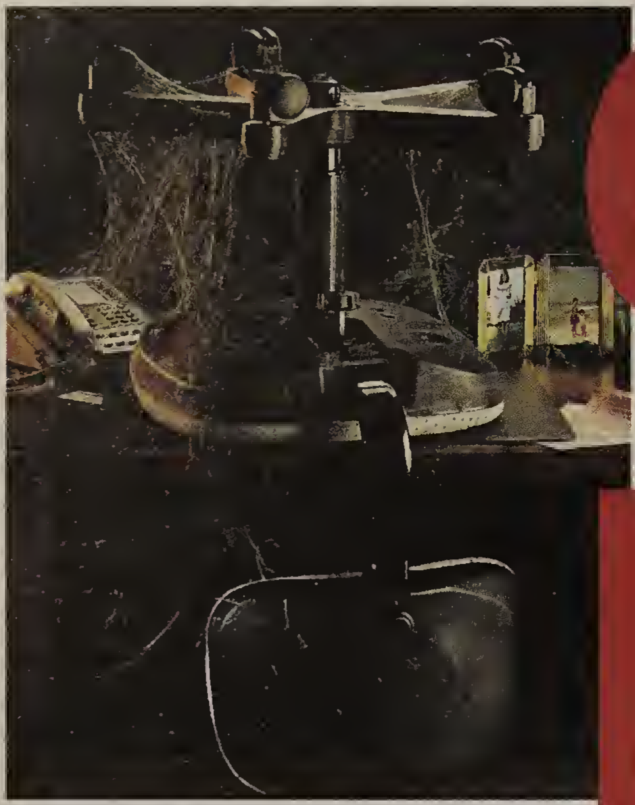

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*Circle Reader Service #***56**

LOCAL NETWORKS

Operating Systems, Management, Hubs, Adapters and Other Equipment

Symantec adds security and ease-of-use to pcAnywhere

BY PEGGY WATT

Santa Monica, Calif.

Symantec Corp.'s Norton Computing division last week said it is rolling out a new version of its remote LAN access software with improved ease-of-use and security features.

The company's pcAnywhere for Windows 2.0, which includes both client and server components, gives nomadic users remote access to LANs as if they were on-site.

The software now includes a largely automatic setup, a scripting language end users can employ without doing any programming and Norton Assistant, an agent that walks users through common tasks or changes. It also runs up to 25% faster because of better caching and compression algorithms.

Ease-of-use was a priority for pcAnywhere for Windows 2.0, said Michael Kerman, a senior product manager at the firm.

"LAN managers told us products like this are being rolled out sparingly because they are thought to be too powerful for end users," Kerman said. "We wanted to shield users from the technology of remote LAN access."

Managers also wanted increased security, so Symantec added tools to restrict drive access, lock the host during initial contact, encrypt data for transmission and track failed logon attempts.

The update can now handle TCP/IP, adding to earlier support for IPX/SPX, the Network Basic I/O System, Microsoft Corp. LAN Manager, IBM LAN Server, Artisoft, Inc. LANtastic, Banyan Systems, Inc. VINES and multiple terminal-emulation packages. It supports Windows NT on the client but not at the server.

"This is an evolutionary version, not revolutionary," said Karl Wang, an analyst with market research firm Dataquest, Inc. in San Jose, Calif. "But it helps solidify Symantec's very strong presence in the market."

And it satisfies longtime users such as Gene Friedman, manager of nets and data communications at a large New York financial institution.

"I like the security enhancements and being able to designate what drives a user can access, down to the directory level," Friedman said.

The updated pcAnywhere for Windows will be unveiled at Comdex/Fall next month for about $199 per single connection between a client and LAN. The LAN 5-Node Add-On Pak adds five users for $389.

©Symantec: (800) 441-7234.

Fibermux and Bytex enhance virtual network abilities of hubs

Fibermux takes aim at market with Crossbow ATM update.

BY KEVIN FOGARTY

Paris

Fibermux Corp. last week introduced add-ons to its Crossbow wiring hub designed to give users an Asynchronous Transfer Mode migration path as well as the ability to set up virtual LANs.

Separately, Bytex Corp. last week also announced add-on hardware and updates to its network management software that will let users create virtual LANs.

Fibermux's ATMosphere Backbone is an add-on to its Crossbow switched Ethernet hub designed to let users add ATM connections between hubs, without forcing users to run ATM to the desktop.

The ATMosphere Backbone comes in two parts, a Crossbow Backplane Module (CBM) and a Virtual Network Engine (VNE).

The CBM fits into a single hub slot and converts packets from Ethernet LANs attached to the hub into ATM cells. The ATM traffic then travels by fiber connections to the VNE, a stand-alone product that directs the traffic to other CBMs either in the same hub or across multiple hubs. The CBMs then convert the ATM cells back to Ethernet frames for transport along the Crossbow backplane or to directly attached workstations.

Each CBM has four front-panel ports that give workstations dedicated 10M bit/sec access to the ATM backbone, as well as four back-panel ports that connect Ethernet LAN segments to the ATM network.

The VNE can support as many as 16 CBMs.

The ATMosphere Backbone offers a switched Ethernet/ATM combination that is similar to what most major hub vendors are promising, said Mary Petrosky, an analyst at The Burton Group in Salt Lake City. But Fibermux may gain a slight advan-

See **Fibermux**, *page 25*

Flipping switches

Fibermux ATMosphere Backbone features:

- Virtual Networking Engine can build as many as 120 virtual LANs, which can be managed via AIRman software.
- Crossbow Backplane Modules convert Ethernet to ATM.

Bytex Series 7700 Switching Hub enhancements:

- Virtual Multiport Repeater and Network Management System updated to let users build 144 virtual networks and assign ports to them from a management console.
- New Port Switched Ethernet module allows port-to-port connection to any LAN attached to the hub.

BRIEFS

EMD Enterprises last week introduced a line of **antivirus firmware** products, called ROMArmor, that protects against boot viruses. ROMArmor is an 8K-byte chip that plugs in to existing boot read-only memory sockets on Ethernet adapters. If a virus is detected, ROMArmor suspends the boot process so a user can remove the virus with additional utilities that are included in the ROMArmor package.

ROMArmor costs $30 per chip. ROMArmor comes with one year of free technical support, a one-year subscription to the EMD System Care virus update service and free access to EMD's bulletin board system.

EMD Enterprises: (410) 583-1575.

ON Technology Corp. last week introduced SofTrack 2.0, an update to its **software metering** product that monitors the number of application licenses concurrently in use on a net. Enhanced reporting capabilities give network managers history graphs and summary reports, among other things. SofTrack now can meter Data Link Library files and can track file openings and closings.

Available as a NetWare Loadable Module, SofTrack 2.0 will meter Windows, DOS, Macintosh or OS/2 files on Novell, Inc. networks. SofTrack's price ranges from $495 for a 50-user license to $3,995 for a 1,000-user server license.

ON Technology: (800) 767-6683.

Hewlett-Packard Co. last week announced an eight-port **Ethernet hub,** the HP AdvanceStack 10Base-T Hub-8U. The Hub-8U includes eight ports with RJ-45 connectors and one slot for an optional fiber, unshielded twisted-pair (UTP) or coaxial cable transceiver module for connection to the network backbone. As many as 16 AdvanceStack hubs can be connected using standard UTP or coaxial cable.

It will be available in December for $299. The management upgrade will cost $199. Transceiver modules range in price from $179 to $375, depending on media.

HP: (800) 752-0900.

BACKUP AND RETRIEVAL

Cheyenne set to ship ARCserve

BY PEGGY WATT

Roslyn Heights, N.Y.

Cheyenne Software, Inc. this year expects to ship a version of its ARCserve backup and retrieval program that mirrors the features in current versions but works with Microsoft Corp. Windows NT networks.

The product will complement Cheyenne's existing Windows NT agent for Cheyenne ARCserve, which backs up Windows NT client workstations on a LAN that uses ARCserve for NetWare.

"You can start with a small Windows NT server and use the agent," said Jon Greene, product manager for the company. "Then, as your data requirements grow, it will make sense to back up at the server using ARCserve for Windows NT."

The first release of ARCserve for Windows NT will provide peer-to-peer backup of Windows NT and Windows for Workgroup clients, Greene said.

"Over the next six months, we'll add features such as heterogeneous network support so users can back up across platforms," he said.

Other features in development include support for the Simple Network Management Protocol and a domain management capability so ARCserve can manage multiple servers as a single unit, Greene added.

Also scheduled to ship early next year is a database agent for SQL Server, enabling live on-line backup of SQL databases.

All implementations of ARCserve, including those for OS/2 and Unix, have a common administrative appearance and data formats.

The familiar look and function is a plus, said Byron Jones, microsystems manager for the University of Miami, which runs ARCserve 5.1 on a NetWare LAN using the Windows NT agent to back up a sole server. He expects to install ARCserve for Windows NT on a new Windows NT LAN that will augment the NetWare LAN.

"The interoperability is a real advantage for us," Jones said. "NetWare has its own backup software, and so does Windows NT, but the products don't interoperate, and they can't exchange files. If we can exchange tapes backed up by ARCserve, that makes things much easier."

Cheyenne is counting on that interoperability to lure users from the Arcada Software, Inc.'s Storage Exec 2.0, a subset of which is bundled with

See Cheyenne, *page 24*

Reality ☑ Check

Product: ARCserve for Windows NT
Company: Cheyenne Software, Inc.

The benefits:

- Full, 32-bit native backup and restore operations for Windows NT 3.5 networks.
- Good security, including built-in virus protection.
- Compatible with other versions of ARCserve.

The drawbacks:

- Not shipping yet.
- Not as tightly integrated with Windows NT as is competing Backup Exec (part of Storage Exec) from rival Arcada.

The user view:

"Cheyenne has paid quite a bit of attention to detail in the interface, letting you tab through the graphical pages and bypass the pull-down menus."

Robert Truxal, vice president of advanced projects, The Strategic Solutions Group

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Vendors look to cash in on demand for network storage

BY PEGGY WATT

Servers are shouldering a heavier load as storage-hungry applications proliferate, but network managers seeking disk real estate to house current and future data also have increasing options.

Recent and pending storage system announcements include new fault-tolerant units, systems that can back up data across different media types and high-density hard drives.

In storage

Product	Price	Availability
Conner's CR12-RAID	Starts at $14,995 (6G bytes)	December
Maxoptix's Praxis optical storage unit	$49,995	4Q
MicroNet's RAIDbank disk array	Starts at $3,695	Now

As more servers are installed on LANs, storage needs correspondingly increase to handle network backup. International Data Corp., a market research firm in Framingham, Mass., estimates that the number of sites with server capacity of 1G byte or greater grew from 53% in 1992 to 70% in 1993.

Corporate network storage needs are expected to grow from about 12G bytes this year to 18G bytes next year and 27G bytes in 1996, according to market researcher Peripheral Strategies, Inc. of Santa Barbara, Calif.

Conner Storage Systems, a Lake Mary, Fla., division of Conner Peripherals, Inc., is among the vendors looking to cash in on the growing demand for network storage systems. The division this week will announce a new 25G-byte Redundant Array of Inexpensive Disks (RAID) system for PC LANs and a new management system for its family of storage products, said Joel Reich, marketing director of Conner's storage subsystems group.

REICH

The Conner CR12-RAID subsystem, which attaches to Novell, Inc. NetWare or Microsoft Corp. Windows NT servers, comes as a tower or a rack-mountable unit with 12 1-inch drive bays. It can support up to 32M bytes of cache RAM, allows hot disk drive replacements while the LAN is running, and sends both electronic mail and audible alarms in case of component failures.

The CR12-RAID, scheduled to ship in December in several configurations, has a starting price of $14,995 for 6G bytes of storage. A Small Computer System Interface (SCSI)-to-SCSI redundant drive controller for the unit is scheduled for release early next year.

Also new is StorView, a Windows-based management system that Conner will bundle with its CR12-RAID and CR6-RAID systems. Its modules include the Conner Array Management System to configure and manage arrays from any network workstation; the Alert Manager Network Loadable Module, which monitors RAID system activity on the network; and the Storage Alert, which lets managers set threshold monitoring and responses, including specifying a sequence of alerts in case of unit failure.

Other vendors with recent storage equipment announcements include:

- Maxoptix Corp. of San Jose, Calif., which expects to ship by year end a NetWare network storage system that combines RAM caching, as well as hard-disk and optical-disk storage. The Praxis unit boasts a direct Ethernet connection rather than tying to the file server, eliminating the need to shut the server down for installation of the storage system.

  Praxis is based on a 486 66-MHz processor and features a 16M-byte RAM cache, 2G-byte hard-drive cache, and two 1.3G-byte erasable Maxoptix T3-1300 optical drives. It also includes an autoloader with a capacity of 60G bytes of optical cartridge storage. Praxis will cost $49,995 fully equipped.
- MicroNet Technology, Inc. of Irvine, Calif., which has doubled the capacity of its RAIDbank fault-tolerant disk array with support for 4G-byte drives. Configurations can vary from 1G to 24G bytes per cabinet, and multiple systems can be linked to boost capacity to 96G bytes.

  The disk array supports Industry Standard Architecture (ISA), Extended ISA, Micro Channel Architecture and VESA Local Bus servers, and connects to NetWare and Windows NT networks. Units support hot replacements and include dual redundant power supplies. Prices start at $3,695, and additional 1G-byte drive modules cost $1,295.

☎Conner: (407) 263-3500; Maxoptix: (408) 954-9700; MicroNet Technology: (714) 453-6100.

Cheyenne

Continued from page 22

Windows NT.

"Simply being on multiple platforms doesn't give value, unless you can integrate and manage the product centrally," said Rob Enderle, an analyst with Dataquest, Inc. in San Jose, Calif. "They need synergy to appeal to central [information systems]."

Cheyenne is promising just that, according to Greene. "We're taking the ARCserve technology across the multiple platforms you find in most MIS shops today," he said.

Cheyenne will show ARCserve for Windows NT at Comdex/Fall in Las Vegas next month and will announce its pricing upon release. By comparison, ARCserve for NetWare ranges in price from $995 to $2,395, and the Windows NT agent is priced at $495.

☎Cheyenne: (800) 243-9462.

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Windows Connectivity Forum

Welcome to Microsoft's Info Center

By Joel Diamond
Technical director
WUGNET
Windows User Group Network
76702.1023@CompuServe.com

Microsoft Corp. has quietly begun previewing some of the communications features that will be embedded in its Windows95 operating system, including a universal in-box and Internet access.

Windows95's Info Center will serve as a universal in-box, enabling users to collect at their desktops electronic mail, voice mail and faxes. It will also support connections to on-line services.

Microsoft is inviting third-party application developers and providers of on-line services to build to Info Center's application program interface.

The Info Center applications will complement Windows95's extended support for Microsoft's computer integrated telephony technology, dubbed the Telephony Application Programming Interface.

For example, Info Center will include support for caller ID, a technology that allows users to recognize callers by their telephone numbers and to bring up files on the caller based on the number.

A new dialer applet will let users create an integrated voice/fax/E-mail phonebook that can be used as both a resource and as a point from which to make calls.

Windows95 will also feature data conferencing capabilities through an application called VoiceView. This will allow users to instantly switch from voice to data to fax transmissions over shared lines.

The technology will be particularly valuable once Digital Signal Processors are more common in PC motherboards and modems.

Industry veterans may recall a similar technology to VoiceView being introduced in the late 1980s by Microcom, Inc. in its Carbon Copy package.

Building on earlier work with Compaq Computer Corp. to build voice processing support into the computer maker's Presidio system, Microsoft will further enhance Windows95 with voice processing support, as well. WIN VP, as the technology is known, will support voice recognition with user-defined vocabularies and text-to-speech conversion. (Everyone remember the 1991 release of Monolog for Windows?)

While Microsoft included information on its serial communications architecture in its Chicago (the code name for Windows95) white paper, the company has recently begun providing more details. Those of you who have been on Library 8 of the Windows User Group Network's forum on CompuServe or the group's Windows95 Connectivity Conference with Microsoft's Windows95 developers may be familiar with some of the technology.

There are a couple of important pieces of the architecture for Windows networking users — in particular, no more two communications port limitations. Of course, you may need new PCs and modems to take advantage of this.

We still don't know exactly what Windows95's Instant Internet Access capability will entail, but Internet service providers are openly telling Windows users that Windows95 will come with push-button Internet access similar to that available in IBM's new OS/2 Warp Version 3.0. Hundreds of Internet access providers are claiming that they have been briefed by Microsoft so they can prepare to promote their services to an avalanche of Windows95 users.

With Windows95 on the way and OS/2 Warp 3.0 including full-Internet access, including a cheap subscription to the Advantis network, Microsoft may look to include access to its forthcoming Marvel on-line service with Windows95.

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To participate on the Windows Connectivity Forum, type **Go Wincon** at any ! prompt on CompuServe. For those of you who are not CompuServe subscribers, *Network World* and the Windows Users Group Network are offering a free membership signup by calling (800) 524-3388. Ask for operator 426.

SunSoft ships desktop LAN administrator, access prods

BY PEGGY WATT

Chelmsford, Mass.

Sun Microsystems, Inc. made another push into the networking arena last week when its SunSoft, Inc. subsidiary unveiled the SolarNet product line, aimed at tying PC LANs into the enterprise.

SunSoft representatives also laid out a road map for SolarNet, promising support for additional net protocols, new utilities and applications, remote access and Internet access products. The new SolarNet products are SolarNet PC-Admin, a client/server desktop management tool for a scalable processor architecture (SPARC)- or Intel Corp.-based server and DOS or Windows clients; and PC-NFSpro for Windows, which lets any Windows personal computer reach across a LAN to any connected server.

SolarNet PC-Admin lets a net-manager configure any client machine on a TCP/IP net from any LAN-attached desktop system, said Phil Rosenzweig, director of engineering for SunSoft PC networking. "The bigger the LAN, the more expensive to get users' workstations configured or to troubleshoot," he said.

PC-Admin can put any user's custom interface on any desktop on the LAN.

It includes backup archiving and restore utilities, and supports E-mail connections using the Simple Mail Transfer Protocol and Points of Presence 2 and 3, electronic mail protocols.

◆ ◆ ◆

> *"[When] I have to load up a new app on the Sun server and all the PCs on the LAN need access to it, PC Admin lets me change the departmental view from my desktop."*
>
> **Ray Hiltbrand, network engineer, Auburn University's College of Engineering**

PC-Admin is available now. A base pack for one server and an administrator client costs $2,250; added clients cost $300 each and are sold in packs of 10.

PC-NFSpro is a Windows implementation of SunSoft's existing DOS-based Network File System (NFS) product. It uses a 32-bit Virtual Device Driver for faster performance and lets users access NFS-compatible data on any enterprise system — including Unix workstations, VMS minicomputers and mainframes, as well as other PCs — over a TCP/IP-based net. Even remote users can call into the network through a Point-to-Point Protocol driver.

PC-NFSpro costs $375 for a single-user license, and upgrades from the DOS version cost $79.

The SolarNet family is actually a series of network services that will support a growing number of common protocols, including TCP/IP, Novell, Inc.'s IPX, IBM's NETBIOS Extended User Interface and Apple Computer, Inc.'s AppleTalk.

"We're trying bring PCs into Unix LANs and the enterprise while retaining existing resources and equipment," said Cheryl Salatino, director of marketing for SunSoft's PC products.

Sun is pursuing the PC LAN market from a platform basis, too; its networking software tools will be marketed with its Netra PC servers, announced last month.

☎SunSoft: (800) 786-7638.

Intel's new Ethernet adapter automates and adjusts net speed

BY MARGARET DORNBUSCH

Hillsboro, Ore.

Intel Corp. today will announce dual-speed Ethernet and token-ring adapters, as well as fast Ethernet support for its network storage product.

The new Ethernet adapter, EtherExpress Pro/100, supports fast Ethernet at 100M bit/sec and traditional 10M bit/sec Ethernet. It automatically senses at which speed the net is running and configures itself accordingly, eliminating the need for net managers to do this manually at each desktop system. Otherwise, to support fast Ethernet on the net, a net manager would just plug in 100Base-T compatible hubs or hub modules.

The adapters perform just as Intel promised, said Mark Lyons, a systems engineer with beta-test site Xerox Corp. in Rochester, N.Y.

One thing Lyons has learned, however, is that 100M bit/sec Ethernet does not provide 10 times the throughput of traditional Ethernet. But it does stand up much better to heavy traffic loads than 10M bit/sec Ethernet, he said.

The adapters will cost $259 for a Peripheral Connection Interface model and $399 for an Extended Industry Standard Architecture (EISA) model.

Intel also is applying fast Ethernet technology to its storage products. The company's StorageExpress System 1.40 is a network backup server that automates most backup and data protection procedures. A $799 fast Ethernet upgrade module allows data transfer rate increases of as high as 85% over 10M bit/sec Ethernet, according to Jim Huston, product-line manager for the StorageExpress products.

Intel rounded out its new product announcements with a dual-speed, autoconfiguring ISA token-ring adapter designed for Intel 486- and Pentium-based personal computers. The TokenExpress Pro Adapter with FlashWorks supports the Plug and Play ISA specification and the recently completed Desktop Management Task Force Desktop Management Interface standard.

Like the EtherExpress adapters, the 4M/16M bit/sec TokenExpress cards can sense at which speed the LAN is running and automatically match it. The adapters cost $295 each.

All the new products are available now.

☎Intel: (800) 538-3373.

Fibermux

Continued from page 22

tage by delivering sooner than market leaders Cabletron Systems, Inc. and Bay Networks, Inc., she said.

ATMosphere Backbone will be generally available in November, said Wendy Campanella, a Fibermux product manager. The VNE will cost $11,995, and each CBM will be priced at $9,995.

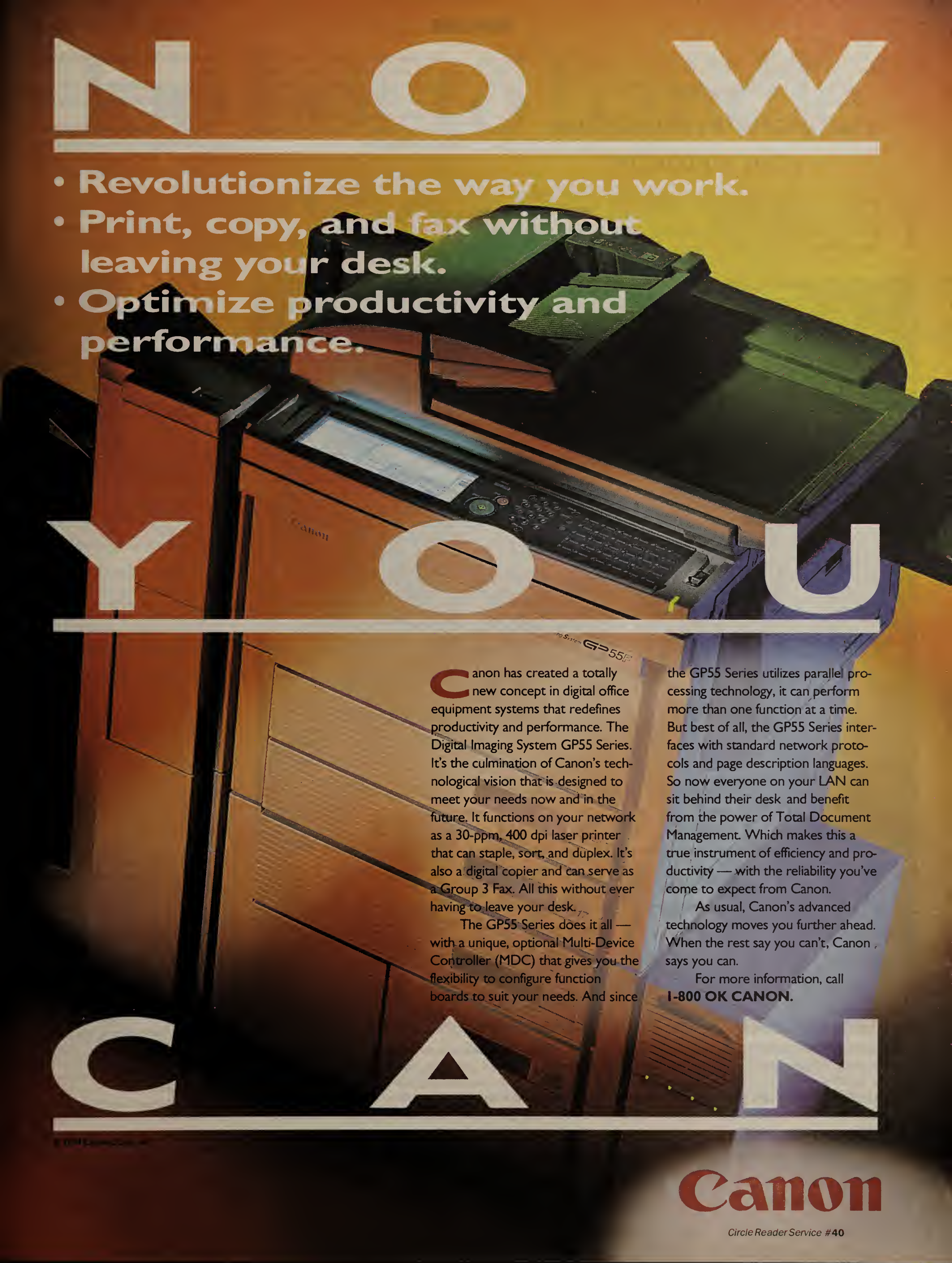
Bytex announced add-ons to its Series 7700 Port Switched Ethernet hubs that will let network administrators easily reassign users to new networks using net management software.

A new module allows nonblocked port switching, meaning ports supporting individual workstations are connected directly through the module rather than over the hub's backplane.

Bytex also is updating its Network Management System (NMS) software and Virtual Multiport Repeater (VMR). NMS and VMR, which together manage the hub's modules, now let network administrators create as many as 144 virtual networks.

Prices for the port modules range from $1,995 for a 12-port Ethernet connection to $2,995 for a six-port fiber connection.

☎Fibermux: (818) 709-6000; Bytex: (800) 227-1145, Ext. 770.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For more information, call **1-800 OK CANON.**

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*Circle Reader Service #***40**

NET RESULTS

by Mark Gibbs

Network momentum and velocity

Yet again, I'm sitting at 35,000 feet up, this time heading to Philadelphia en route to the first of my *Network World* Capitalizing on the Internet seminars.

I'm not sure why, but I've spent the past two hours trapped in the plane watching *Speed,* a movie starring Keanu Reeves.

Now movies on planes are rarely satisfactory. The sound quality is never good, the screen is always at an acute angle to your line of vision, and the film has usually been edited in such a way as to not only remove the swearing and salacious content, but also to irreparably damage the story line.

There are some films that are so intrinsically lame that the adverse conditions hardly make a difference. *Speed* is one of them.

The focus of the movie is the bad guy's fiendish plot to rig a bomb on a bus so that the device gets armed when the bus goes over 50 miles per hour and will automatically detonate if the bus should subsequently fall below that speed.

I'll skip the rest of the plot, which is far too tedious to detail. Besides, I'd really rather forget the experience.

But it did strike me that there is a frightening parallel between *Speed* and your corporate LANs that is worth considering. It concerns the consequences of stopping the forward motion of your network.

We have all struggled to get our networks running. We have installed them, configured them, tuned them, extended them, upgraded them, tuned them, upgraded them, extended them....

Those of you who have been on this treadmill must have noticed by now that you can't get off. You are trapped.

Just like the wretched bus in the movie, if your network falls below a certain threshold of operation, there will be serious trouble. That threshold is one defined by the level of functionality and performance required to support your organization.

Worse still, it is a threshold that is always moving up.

The central problem for network managers is to figure out how to maintain forward momentum to stay ahead of the rising threshold. The trouble is that when you're down in the swamp and up to your ASCII in alligators, it can be hard to raise your head up long enough to find out what's going on.

A resource that I believe is significantly underused and a tremendous source of information about staying above that dangerous threshold is user groups.

Being involved with Novell, Inc. NetWare over the years, I've usually joined a local NetWare User Group. The benefit of being a member of one of these groups or a group focused on another vendor's offering is immense.

In the Novell world, even the smallest user groups get visited by Novell reps and get demos of the latest products.

Third-party hardware and software vendors (if they are smart) treat user group meetings as opportunities not only to present their products to an interested audience, but also as focus groups to determine their fit with the market's needs.

If you haven't checked out user groups in your area, you're missing out. And if you get involved, be active. Network (in the social sense) with the other members and share your knowledge.

What you'll get from your user group involvement is a flow of information from others who are fighting the same or similar alligators.

This kind of peer interaction is one of your strategic tools that will help keep you above the detonation threshold.

And remember, if you lose forward speed, there will be an explosion. All that will be left is a crater where your job, or even your company, used to be.

➜ Gibbs is a consultant and writer in Ventura, Calif. He can be reached at (800) 622-1108, Ext. 504, or on the Internet at mgibbs@rain.org.

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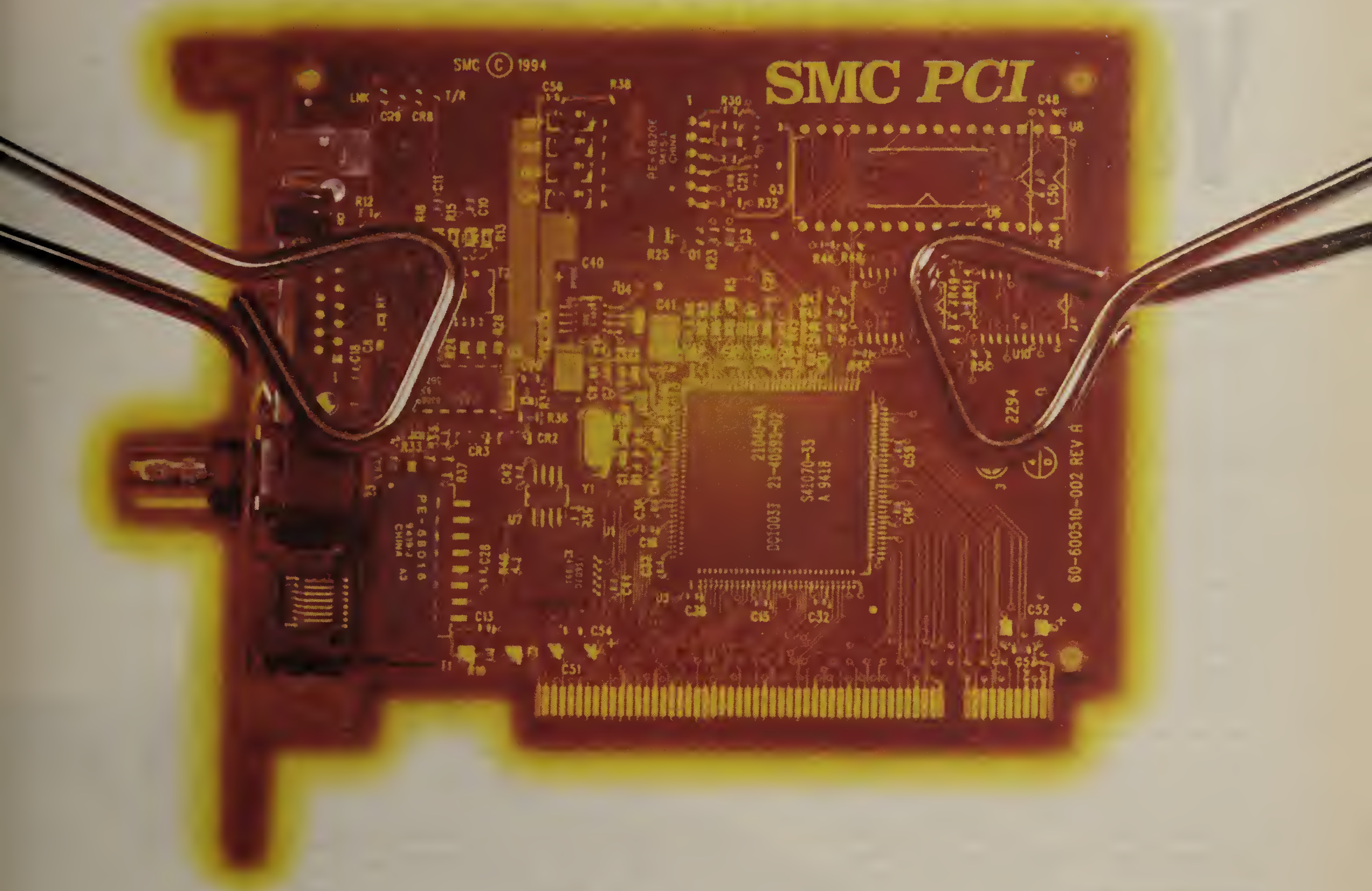

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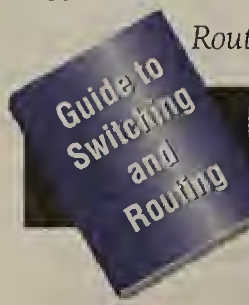

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Circle Reader Service #**47**

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OUTSOURCING

Outside help arrives for branch office mgmt.

BY JOANIE WEXLER

Bedford, Mass.

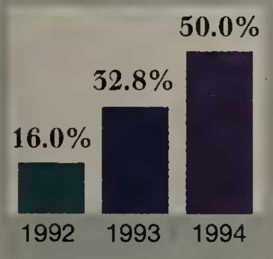
Plugging support gaps in remote branch offices could become less onerous as LAN outsourcing services emerge and user companies grow more amenable to farming out networking tasks.

At least one new LAN and desktop management service, for instance, will be officially announced at the Fall 94 Comdex show in Las Vegas next month by ACSYS, Inc., a year-old spin-off of worldwide electronic connection device maker AMP Co. The idea is to help user companies get a centralized grip on desktop and LAN equipment, operating systems and application software in branch offices.

ACSYS' NetGain Remote Office Support service relies on an ACSYS-assembled platform of existing third-party management systems plus ACSYS-developed software for centralized control of remote LANs and desktops. It costs about $1,200 a month per 15-station LAN, according to Larry Gormley, director of ACSYS' net services division.

Willingness to outsource

More companies are becoming amenable to the idea of asking for outside networking help, reflecting the economic and skill constraints they face.



Based on an annual survey of 280 to 300 companies.

SOURCE: DATAQUEST, INC., FRAMINGHAM, MASS.

TEST DRIVE

Lutheran Social Services of Illinois (LSSI) has been using NetGain for about six months at six LAN sites with roughly 25 users at each.

"My end users are tickled pink," said Bret Smith, director of information services at the social services agency, who considers ACSYS an extension of his staff. ACSYS serves as LSSI users' first point of contact, and Smith said they have found ACSYS to be "more responsive than our own software vendors, who won't call us back in a timely manner."

He turned to ACSYS because LSSI is in the process of computerizing 105 sites throughout Illinois – 45 of which are large enough to merit LANs.

"I couldn't have my staff do the installation and keep up with user support at the same time," he said.

Such growing demands on network staff are leading to more user willingness to outsource at least some functions (see graphic).

"A real support gap has developed as companies move their client/server applications outside of campuses and into remote sites and homes," said Mary Johnston Turner, principal at Northeast Consulting Resources, Inc. in Boston. She said several of her clients are beginning to seek outside sources for managing remote sites.

ACSYS will manage DOS, Windows and NetWare 3.X and 4.X operating environments. Among the applications it will manage are Lotus Development Corp.'s SmartSuite; Cheyenne, Inc.'s Arcserve NetWare backup utility; Novell's PerfectOffice and Quattro Pro; Borland, Inc.'s Paradox; DataStorm Technologies' ProComm; and Distributed Communications Associates' CrossTalk.

ACSYS has built a software platform in its control center here that melds its own Desktop Management Interface (DMI)-compliant intelligent agents on desktops with management software packages, such as Microsoft Corp.'s NT-based Microsoft System Management Server; Network Managers, Inc.'s Vision; and Cognitive Systems, Inc.'s Remind.

The platform proactively monitors and traps printing and logon problems/errors and notifies the ACSYS-manned help desk.

LSSI's Smith also requires that ACSYS inform him of changes to user workstations, such as when new software is loaded, so he can enforce corporate software standards and avoid viruses.

ACSYS will also sell its platform into firms preferring to centrally control their remote sites using their own staff.

As yet, NetGain does not deal with addressing and router table configuration. LSSI still relies on its primary LAN equipment provider, Racal-Datacom, Inc., for such services.

©ACSYS: (617) 275-4455.

Bell Atlantic files for wide-area FDDI service

NYNEX FDDI customers wait in the wings, seeking to link N.J. sites.

BY DAVID ROHDE

Washington, D.C.

Bell Atlantic Corp. is proposing a new service that lets users extend their 100M bit/sec Fiber Distributed Data Interface LANs across WANs..

The service, called Full FDDI, reportedly has been requested by a number of big financial firms that want to use it in conjunction with a similar service introduced in February by NYNEX Corp., enabling them to connect offices in New York with data centers in New Jersey. Bell Atlantic's service is scheduled to take effect Nov. 21, pending approval by the Federal Communications Commission.

But a key difference in the structure of the two regional Bell holding companies' services had Bell Atlantic officials on pins and needles last week as they awaited a possible legal challenge from equipment manufacturers.

Under Full FDDI, Bell Atlantic places FDDI concentrators on the customer's premises. Data is sent via a fiber connection to Bell Atlantic central offices (CO), where it is transported onto a pair of counterrotating fiber rings. Each customer has a dedicated pair of rings in the CO linking the user's offices in the region.

Under NYNEX's version, called Enterprise Service FDDI, the FDDI concentrators are located not at the customer premises, but at the carrier's CO. The customer locations use routers to send data packets to the CO.

A specific FDDI concentrator — one from 3Com Corp., in NYNEX's case, and an unnamed vendor in Bell Atlantic's case — is involved in each service.

Bell Atlantic's arrangement could cause manufacturers whose equipment wasn't chosen to protest that the service depends on a specified piece of customer premises equipment, sometimes interpreted as a violation of FCC antibundling regulations.

100M-bit power

Charges for Bell Atlantic's Full FDDI service, based on a 3-year contract:

Rate element	Monthly charge
Single-network node	$1,850
Dual-network node	$3,500
Repeaters	$1,400 each
Mileage between central offices	$90 per mile

SOURCE: BELL ATLANTIC NETWORK SERVICES, INC., ARLINGTON, VA.
GRAPHIC BY TERRI MITCHELL

The NYNEX service has 16 customers, including banks and hospitals, said Leslie Budd, staff director for NYNEX's Data Sales and Applications Support division in Boston.

Now NYNEX is rooting for Bell Atlantic to get its service up and running so it can close deals with several more unnamed firms in Manhattan that have big operations centers in New Jersey, which is Bell Atlantic territory.

More than six Wall Street companies with operations in New York and New Jersey are awaiting approval of the Bell Atlantic service, said Oscar Mujica, a Bell Atlantic product manager in Newark, N.J.

"It doesn't behoove them to take it [until the Bell Atlantic service is available] because their application is across the corridor," NYNEX's Budd said.

However, both Mujica and Budd said there is demand for the service throughout their respective regions.

Under a single-local access and transport area solution in the Bell Atlantic service, each concentrator contains two fiber connections — one for each of the two directions on the carrier's ring.

The user pays $1,400 for installation of each node, then pays monthly charges for the node and mileage between Bell Atlantic COs connected to the fiber ring (see graphic).

In the multiple-LATA solution, the carrier will place nodes at a specific customer location to connect two pairs of counterrotating rings.

The dual network-attached nodes also have to be used where the total distance covered by the aggregate LAN interconnection is 100 km or more because of distance limitations defined in FDDI standards, according to Frank Shannon, a Bell Atlantic technical support specialist here.

BRIEFS

Kentucky's **American Automobile Association (AAA)** has gone live with **Racotek, Inc.**'s wireless system, which interfaces Racotek-enabled applications to any of a variety of wireless nets, based on parameters such as coverage or least cost routing. Kentucky AAA is implementing mobile data communications to streamline dispatching for its emergency road service operations in about 50 tow trucks in the Louisville area.

AT&T Global Information Solutions and **Delta Air Lines, Inc.** have named William Belew president and chief executive officer of the information technology joint venture that the two companies announced in August (*NW*, Sept. 5, page 32). Belew was formerly chief information officer of W.R. Grace & Co., based in Boca Raton, Fla.

AT&T last week also said it has formed a new subsidiary, **AT&T NETCON, Inc.**, that will provide construction services for telephone and cable television companies building multimedia networks. Meanwhile, **AT&T Tridom** said its object-oriented AEGIS Network Management System for satellite-based networks is now available internationally.

Regional Bell holding company **Ameritech Corp.** last week said it has filed a request with the Illinois Commerce Commission to offer **long-distance** services throughout the state in 1995.

Frame relay carrier **EMI Communications Corp.**, a member of the nationwide UniSpan partnership of regional frame relay service providers, has established a **Network-to-Network Interface** link with **Bell Atlantic Corp.** This means user traffic could traverse both nets if users seek wider coverage or diverse routing.

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The new AS/400 Advanced Series from IBM

X.25 protocol proves to have enduring appeal

BY BILL BURCH

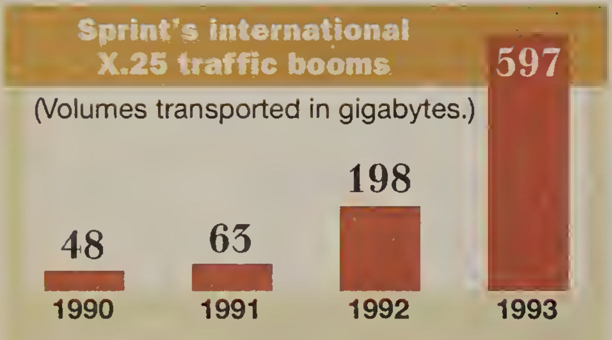
Washington, D.C.

Think X.25 is an old protocol on its way out or a relic that will soon be supplanted by frame relay and other new technologies?

Think again. Here in the U.S., growing demand for on-line services and remote access is stoking the X.25 market. Overseas, the service still dominates data transport in Western Europe, and it is usually the only game in town in developing markets such as Eastern Europe and Latin America.

Sprint Corp. will triple X.25 network capacity by year end, and traffic is currently increasing at 10% per month, according to Stephen Rys, the carrier's SprintNet services manager.

The big reason for the growth: Services like America Online are using carriers' X.25 nets to connect dial-in customers to host computers. That, in turn, is attracting new carriers to the X.25 market, forcing old-guard carriers to be more flexible on price, Rys said.



Note: Sprint's X.25 coverage from 1990 to 1993 grew from 8 to 42 countries.

GRAPHIC BY SUSAN J. CHAMPENY

The on-line services boom is also having an indirect effect by increasing executives' awareness of dial-in networks. Combine increased user awareness with clean-air and family-leave laws, and telecommuting does not seem to be such a foreign concept. Meanwhile, X.25's traditional strength as a dial-up connection for remote offices endures.

In St. Louis, Petrolite Corp. has 200 users dialing in from remote sites via CompuServe, Inc.'s X.25 service. "It's a lot cheaper than having 32 dial-in lines with 32 modems sitting there," said Jim Benso, a manager with the company's technical support group.

As the price of frame relay falls, Benso plans to shift some of his X.25 connections over to permanent virtual circuits but still use X.25 for backup. Petrolite will also continue to use X.25 to connect overseas users in countries within Southeast Asia, such as Hong Kong, Indonesia, Japan and Singapore.

Worldwide, X.25 is practically Petrolite's only choice. Even in countries such as France, Germany and the U.K., frame relay is just starting to replace private lines for a few companies, said John Matthews, a principal consultant with Ovum, Ltd. in London.

In those countries, X.25 demand is growing. Its use is rising 9% per year in France and 19% per year in Germany and the U.K., Matthews said.

"In the case of Eastern Europe, whilst the communist regimes were still in place, [the X.25 nets] tended to be very small and relatively underused," Matthews said. "They're beginning to expand a bit more now."

In Latin America, where some of the fastest growth is taking place, poor-quality lines mean firms need X.25's error correction to guarantee delivery of packets, said Bill Wolfe, electronic messaging director with Infonet Services Corp. in El Segundo, Calif.

Not only does X.25 enjoy a common level of service worldwide, but user comfort is also a big plus. "It's a set-it-and-forget-it data protocol," he said. ◼

Investors get virtual trading floor option

Software plus wireless connections keep traders on top of the market.

BY JOANIE WEXLER

New York

Real-time mobile stock trading capabilities are emerging in the form of software and wireless links packaged by USEMCO Technologies, the software development arm of U.S. Equity Management Corp.

Such capabilities could benefit brokerage firms looking to increase their trading volume, as well as individual traders seeking constant access to market data. However, mobile trading could also endanger the jobs of some in-house stockbrokers, who might get bypassed by market-savvy investors, analysts said.

USEMCO has teamed with packet radio network operator RAM Mobile Data and MarketShare, Inc. — a provider of trade routing services to stock exchanges — to give investors wireless trading floor access from virtually any location.

The $295, Windows-based end-user component of the application, called Mobile Trader, allows traders to execute and confirm orders via a desktop or portable personal computer. Users also can download real-time quotes for more than two million individual stocks, options, futures, commodities, indexes and mutual funds.

In addition, users can define parameters so the program will alert them when a particular stock reaches a predefined level.

Individual investors' trades would still be executed through their brokerage house of choice, but the need for a stockbroker could be eliminated in the case of self-executed transactions.

On the other hand, analysts said a stockbroker toting the user package could take a client to lunch, pitch a stock and sell 5,000 shares on the spot.

Blaine Burdick, a trader in Minnetonka, Minn., using the system, said Mobile Trader is a "little faster and a little easier" than going through his broker, but the big draw is the $295 flat monthly price. Burdick said he was formerly paying $653 a month from Signal Technology, which also provides a communications tool for obtaining market information.

Brokerage firms can install a server and radio antenna for about $2,000, which will allow them to take orders from clients using Mobile Trader, said Brian McCahery, chief executive officer at USEMCO.

USEMCO's McCahery manages his stock portfolio via the virtual trading floor.

USEMCO has already cut deals for the package with brokerage houses Bernard Richards and Gelderman Securities, and reportedly has contracts pending with Merrill Lynch and other large brokerages.

Some brokerages are planning to give clients the $295 end-user package for free as an incentive to place more transactions through their firms, McCahery said.

One Mobile Trader user, Wes Sabourin in Mesa, Ariz., said he has made "a lot of money" since using the package, though he declined to indicate how much his profits have risen. Sabourin, who had no previous experience with computers, said he formerly traded his stocks via a broker "but it wasn't a comfortable situation; they were rush-rush. I wanted to do it on my own."

Sabourin now trades every day and said the RAM Mobile Data net has been fairly reliable. However, on a recent trip to the Pacific Northwest, the system went dead when he got 40 to 50 miles outside of large cities such as Seattle, he said.

The deal with USEMCO is not the first attempt by RAM Mobile Data to penetrate the brokerage industry. Earlier this year, RAM Mobile Data struck an alliance with Davidge Systems, Inc., a large operator of an order-routing net, for alternative access for mobile brokers or desktops where wired access is difficult.

RAM Mobile Data estimated Davidge has about 20 firms up on its wireless trading system. ◼

Teloquent lets more users access call detail reports

BY DAVID ROHDE

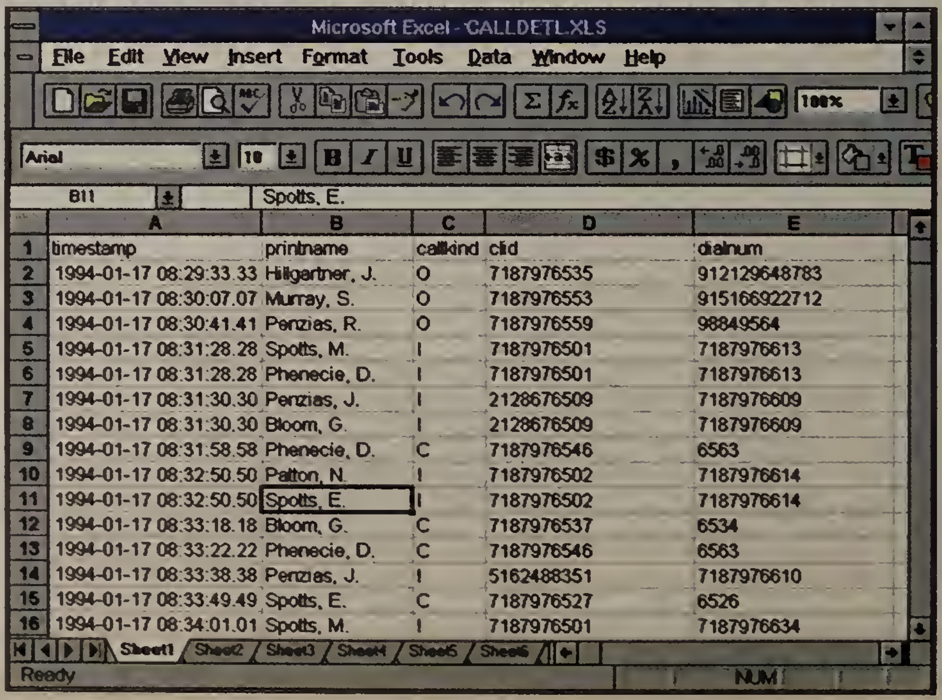
Billerica, Mass.

Teloquent Communications Corp. has devised a way for managers to tap into the call detail captured by the vendor's Distributed Call Center (DCC) system from virtually any personal computer in an enterprise network.

Dubbed Desktop Reports for Windows, a new application is available to users of DCC, Teloquent's PC-based low-end call distributor. DCC harnesses the signaling in ISDN D channels to route calls to agents in 800 call centers, help desks and other workgroups sharing a telephone number.

The product works with automatic number identification or calling line ID services, where available, enabling it to capture the number from which a call was placed.

One site where Desktop for Windows is being tested is Ameritech Advanced Data Services in Hoffman Estates, Ill. The product gives technical architect George Theros the ability to call up detail on incoming calls from any PC on the same Ethernet as the DCC.



	A	B	C	D	E
1	timestamp	printname	callkind	clid	dialnum
2	1994-01-17 08:29:33.33	Hillgartner, J.	O	7187976535	912129648783
3	1994-01-17 08:30:07.07	Murray, S.	O	7187976553	915166922712
4	1994-01-17 08:30:41.41	Penzias, R.	O	7187976559	98849564
5	1994-01-17 08:31:28.28	Spotts, M.	I	7187976501	7187976613
6	1994-01-17 08:31:28.28	Phenecie, D.	I	7187976501	7187976613
7	1994-01-17 08:31:30.30	Penzias, J.	I	2128676509	7187976609
8	1994-01-17 08:31:30.30	Bloom, G.	I	2128676509	7187976609
9	1994-01-17 08:31:58.58	Phenecie, D.	C	7187976546	6563
10	1994-01-17 08:32:50.50	Patton, N.	I	7187976502	7187976614
11	1994-01-17 08:32:50.50	Spotts, E.	I	7187976502	7187976614
12	1994-01-17 08:33:18.18	Bloom, G.	C	7187976537	6534
13	1994-01-17 08:33:22.22	Phenecie, D.	C	7187976546	6563
14	1994-01-17 08:33:38.38	Penzias, J.	I	5162488351	7187976610
15	1994-01-17 08:33:49.49	Spotts, E.	C	7187976527	6526
16	1994-01-17 08:34:01.01	Spotts, M.	I	7187976501	7187976634

Theros uses Teloquent's DCC for Ameritech's own 1-800-TEAM-DATA phone number, which customers can call to get in touch with experts on ISDN, switched 56K bit/sec and related services. Theros said Desktop Windows soon will also give the same ability to managers of several other Ameritech call centers and internal help desks.

Teloquent's DCC is based on an Intel Corp. 486-based PC with ISDN Basic Rate Interface cards. The PC runs SCO Unix operating software and an off-the-shelf Informix Corp. database used to store information about each incoming call.

By fitting the PC with an Ethernet adapter and using new Teloquent software supporting TCP/IP, the database information is made available to other users on the net from their own PCs, unlike the typical ACD setup where only the call center manager has access. These users can manipulate the call data in their own Windows applications, such as Excel (see screen shot).

"I can pull up a report any time I want and dump it to a local printer or to a network printer," Theros said.

Without this application, the reports can only be generated at the phone server, said David Penzias, Teloquent marketing vice president. Then the data must be rekeyed for use in other applications, a frequent situation when department heads are tracking calling patterns.

Also, Theros can perform some help desk or call center administrative functions. "I use that IP connection to come in as a remote console [so] I can perform all administrative functions off my PC," he said.

Desktop Reports for Windows is shipping now for $495 per user. Teloquent's DCC sells for $2,500 to $3,000 per user.

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Multilevel Security Features	X	X	X	X
Asset tracking	X	X	X	
PC tattooing	X	X	X	
Optional Desktop Management Software	X	X		
Bi-directional parallel port	X	X	X	X
Desktop Management Interface (DMI)[3]	X	X		

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RATE & TARIFF MONITOR

by Eric Paulak

Playing The Price is Right *with frame relay*

A recent study claims that within three years frame relay will become the second most prevalent data service next to private lines.

That may well be, but before it can happen, frame relay has some hurdles to overcome. The technical glitch — the Network-to-Network Interface (NNI) — is pretty much taken care of. But cost — not the actual rates, but the lack of pricing information — leaves users not knowing how much they're going to pay for the service, and that's going to delay any universal acceptance of frame relay.

A little background: Until just recently, if you wanted to set up an interstate, interLATA frame relay network, you couldn't do it unless you actually built the thing yourself. Why? Both long-distance and local carriers offered frame relay service, but neither supported an NNI protocol that would allow them to connect their separate networks. So you had to use dedicated lines for local access.

Now, however, all of the Bell companies and the Big Three long-distance carriers have said that they do or will support the NNI protocol. The problem of pricing, however, still remains.

Long-distance carriers are not required to file tariffs with the FCC for their enhanced interstate, interLATA services (for example, Asynchronous Transfer Mode, Switched Multimegabit Data Service and frame relay).

MCI has made a strong point about this lack of pricing by offering rate sheets on all of its enhanced services. It's a nice effort, but because its services are not actually filed as tariffs, MCI can and does vary its frame relay prices to suit individual needs.

But local exchange carriers (LEC) do have to file tariffs with the FCC for interstate access to these same services.

This requirement didn't make any sense until the acceptance of NNI because the long-distance carriers would not accept anything but dedicated access to their frame relay networks. This meant you had a bunch of tariffs out there for frame relay access service that nobody used.

Now that NNI is being implemented, the LECs are starting to file tariffs for interstate frame relay access, meaning the rates they will charge the IXCs. And, for the most part, the rates are staying in line with the LECs' rates that were based on the User-to-Network Interface (UNI), a protocol that offers less end-to-end supervision.

Bell Atlantic, for example, has separate entries for NNI and UNI protocols. At 1.54M bit/sec, however, each end of an NNI or UNI frame relay link costs $220 per month. The actual line, known as a permanent virtual circuit (PVC), is included in that cost, albeit at a committed information rate (CIR) of zero.

US WEST hasn't differentiated between UNI and NNI protocols in its rates; 1.54M bit/sec frame relay access of any kind costs $111.79 per month on each end of the line, plus $164.94 per month for one PVC at a CIR of 1.54M bit/sec.

So if you want to connect two sites in Maryland and Oregon, you now have an idea how much your local portions are going to cost, but not the line in between. And the only way to find out is to put the service out to bid.

A large company that has a staff of telecommunications and data communications analysts may be able to put every possible service offering out to bid. And these same companies will probably be the first ones to switch some of their private lines over to frame relay. But the majority of one-person communications departments would never get anything done if they had to put each new service out to bid.

As a result, you may see frame relay being used by the Fortune 500, but you're not going to see the proliferation that some are predicting until telecom managers can have all the information on a service that allows them to fully evaluate it in their own way and time. Requiring tariffs would allow end users to do that.

➡ Paulak is associate publisher for the Center for Communications Management Information, a provider of rate and tariff information in Rockville, Md. He can be reached at (301) 816-8950, Ext. 327.

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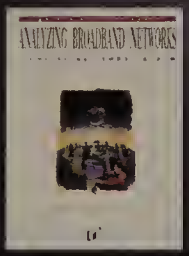

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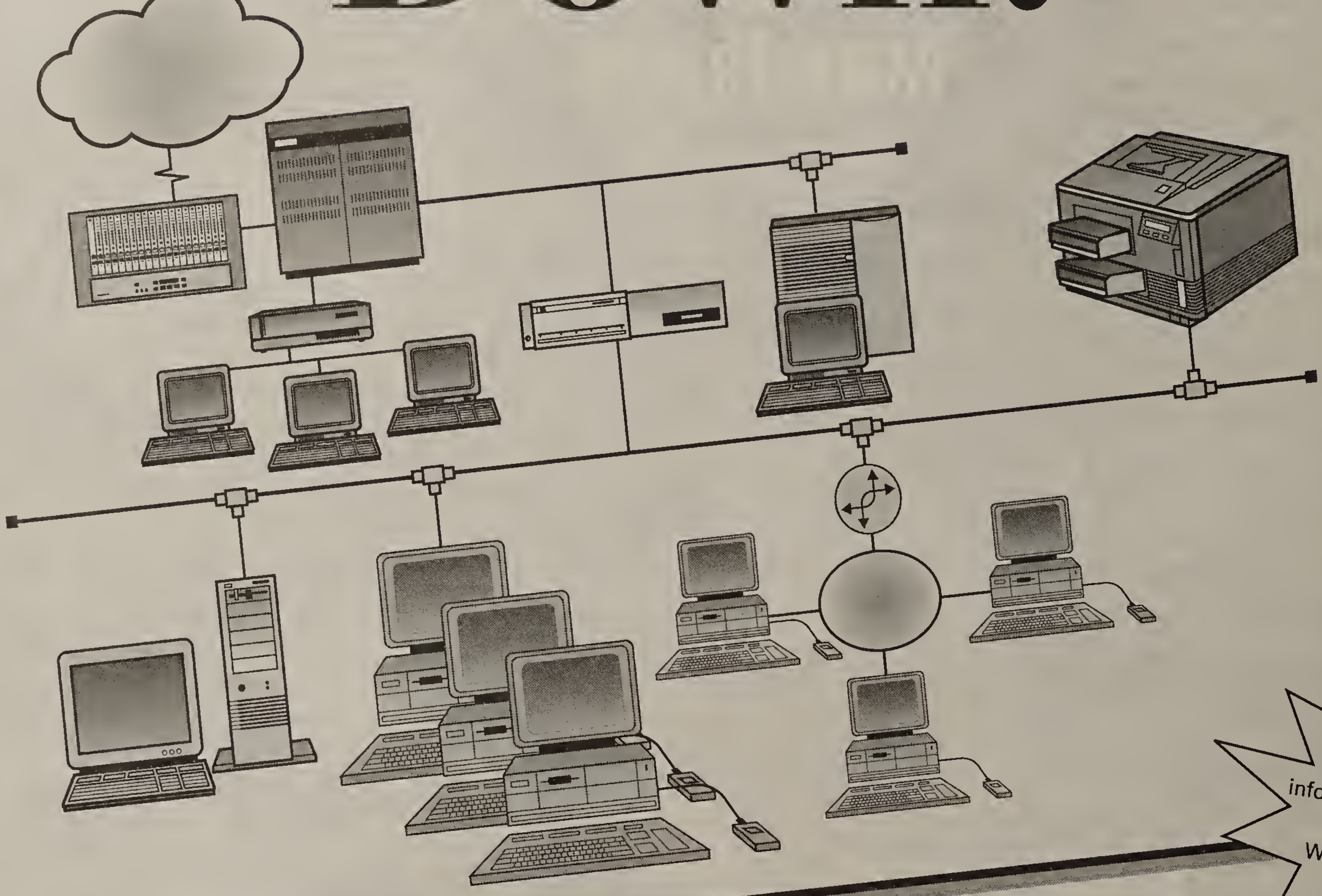

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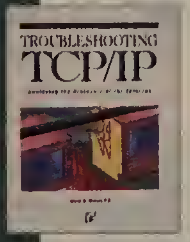

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- *Study the various TCP processes, including connection establishment, sequence control, flow control and connection termination.*
- *Learn how TCP/IP is supported in various host and LAN operating systems.*
- *Understand how IP-based routing works.*

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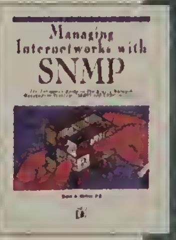
- *Discover how SNMP can be implemented for WAN management, supporting broadband technologies such as frame relay, SMDS and ATM.*



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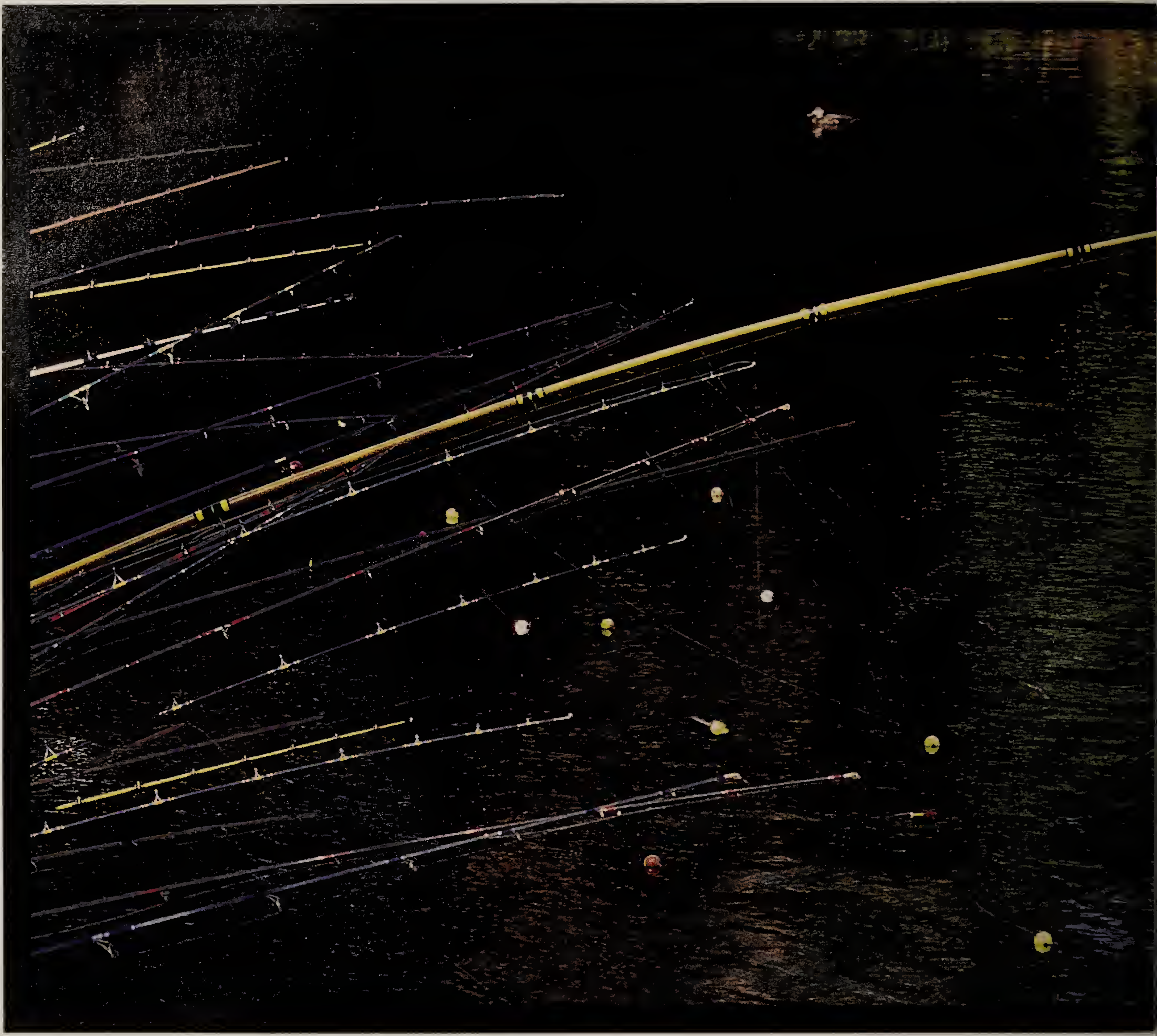
NETWORK WORLD

COLLABORATION

A SUPPLEMENT AUTUMN 1994

WILL OLE BE THE SNA OF THE '90S?

Client/server collaborative computing demands new standards. Page 16.



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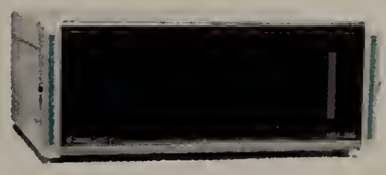

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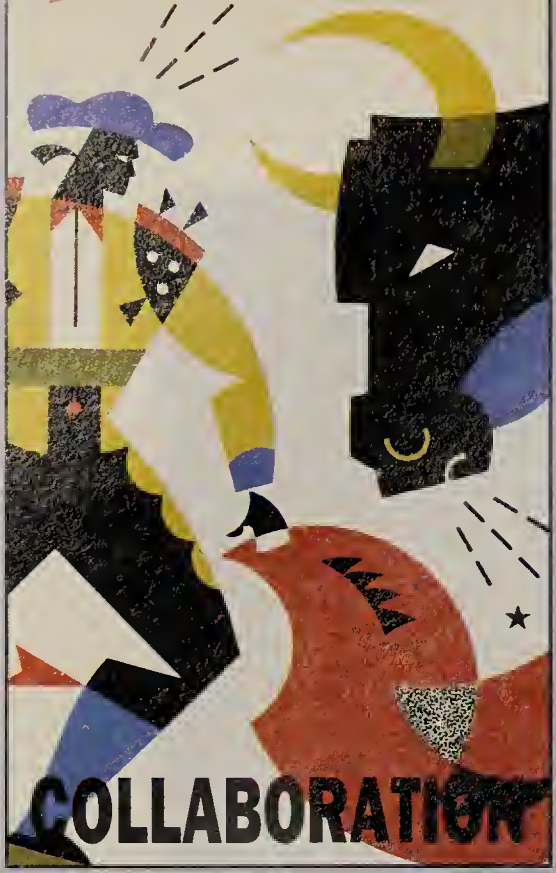

Jessica Lipnack and Jeffrey Stamps, the husband and wife consulting/author team profiled on page 32, talk about the shift to networked organizations as a natural progression from the bureaucratic and hierarchical principles that have gone before.

And a shift it is, replete with change at multiple levels. The adoption of team-based organizational structures and concomitant movement to new network technologies is raising questions about everything from infrastructure to core systems architectures.

In this issue of *COLLABORATION*, we look at some of the basics: the security issues involved with new collaborative computing applications; whether ATM is ready to deliver on all it has promised; and the question of whether Microsoft's OLE technology will ultimately mean to networking what IBM's SNA does today.

We also talk to a leading-edge user at Texaco who is wrestling with a leading-edge problem: the task of patching together emerging collaborative computing tools and integrating the resultant "system" into business processes.

While the shift is enormous and the problems daunting, nothing big comes out of something easily gained. And the promise of networked companies — those able to capitalize on team concepts and mold information technology to meet team needs — is nothing if not big. The payback is measured in terms of nimbleness, time to market, employee job satisfaction and profitability.

Lipnack and Stamps say that as we move into the 21st century we will see more and more organizations forming networks — networks of employees meant to break the shackles of bureaucracies and hierarchies, as well as inter-organizational networks designed to leverage complementary corporate strengths.

"Organizational advantage is the most critical thing you can have for the 21st century," they say. And collaborative computing technology is the key to making the most of it, even if it does mean rethinking some of the basic tenets that we take for granted today.

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Features

Collaborative computing's soft underbelly •

By Charles Wood

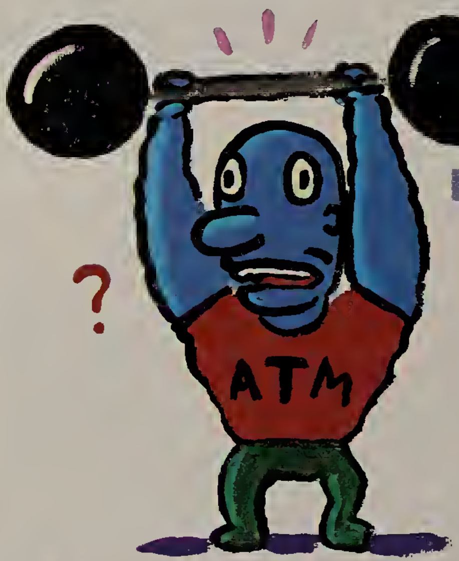
Employees tweaking calendars of corporate competitors. Staffers knocking out a company's entire Notes network with a slip of the wrist. Security takes on new meaning in the world of collaborative computing. Page 9.

Earl Craigfield, SRI: Talks security

OLE taunts SNA to bullfight •

By David Chapell

IBM's SNA is a mainstay of everything from banks to insurance companies. But Microsoft's OLE may replace it as the glue for linking applications in the age of client/server-based collaborative computing. Page 16.



Is big, bad ATM overpumped? •

By Mary Petrosky

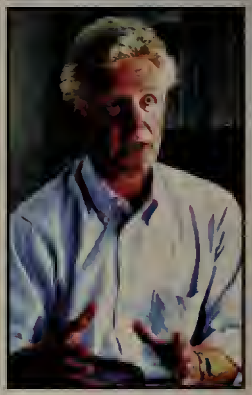
With its ability to support any type of traffic, operate at any speed and reach from the desktop across the wide area, ATM has the potential for brilliance. But a lot must change before it can be exploited as an infrastructure for emerging applications. Page 21.

Teams star at Texaco • By John Dix

Texaco has assembled a leading-edge collaborative computing infrastructure, an effort that has made one thing clear: Integration of the tools and integration of the resultant "system" into business processes are the keys to success. Page 28.

Networks of people • By John Dix

Don't reinvent the corporation; reorganize it around existing strengths. That's the message of Jessica Lipnack and Jeffrey Stamps, authors of the new book *The Age of the Network: Organizing Principles for the 21st Century.* Page 32.



Jessica Lipnack and Jeffrey Stamps

Departments

Sum of the parts • A new effort to define what makes teams tick; Imaging costs per seat plummet; The Internet Index; A source for everything you need to know about ATM; LAN-based E-mail to overtake host mail. Page 6.

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Circle Reader Service # **26**

Sum of the parts

THE MYSTERIES OF GROUPS

A new effort to divine what makes teams tick

Much work has been done trying to understand how individuals solve problems and go about intellectual tasks like programming or writing documents, but little research has been done into how computer-supported groups carry out these tasks.

John Smith, at the University of North Carolina, is trying to put a stake in the ground by building a general theory about collaborative behavior. His new book, ``*Collective Intelligence in Computer Based Collaboration*,'' was published Lawrence Erlbaum & Associates.

``The book is a first step to try to outline the general shape of what a theory of collective intelligence or collaborative behavior would look like,'' Smith says. "We're interested in the human and social dimensions of collaborative behavior as well as the technology to support it.''

In an effort to establish a theoretical context, the book looks at the different kinds of information groups build up and use. This includes tangible knowledge in documents and specifications, intangible knowledge stored away in the minds of group members, and shared intangible knowledge such as common ideas.

"I try to outline how groups build up information in these different forms and how one form of information gets transformed into another,'' Smith says. "Then I try to examine some abstract constructs that we can use to talk about that process. This is the kind of stuff you have to look at as we begin to study groups as intelligent organisms.

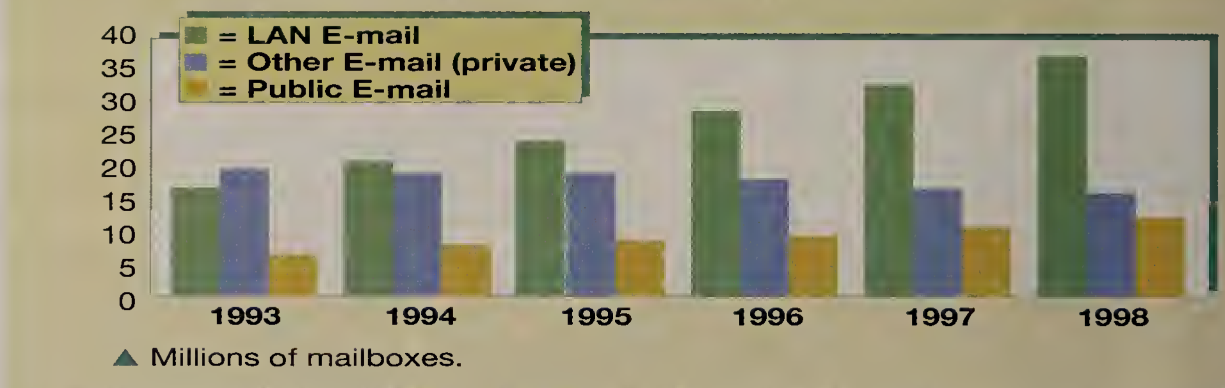
"We're really talking about a distributed form of intelligence," Smith says. "So the architecture of any model of collaboration is going to resemble a distributed computing system in the same way that models of individual behavior were described in terms of individual computing systems."

The model will also help drive research. "Our approach is to build experimental systems so we can not just test the technology, but use the system to observe users' behavior and make a record of it so we have a basis of data to analyze that kind of behavior."

The book, which only concerns groups supported by computer-based collaboration tools, reviews the functions of various software packages.

LAN mail to overtake host mail

Worldwide E-mail installed base forecast



▲ Millions of mailboxes.

The worldwide messaging market is forecast to grow from 43.4 million mailboxes in 1993 to 67 million by 1998. By the end of this year there will be more E-mail boxes supported on LANs than on hosts.

GRAPHIC BY TERRI MITCHELL

SOURCE: BIS STRATEGIC DECISIONS, NORWELL, MASS.

A WINDOW ON THE WORLD

The commercialization of the Internet has begun.

Mosaic Communications Corp. this month released a commercial version of Mosaic, the software designed to help users collaborate with people around the world by harvesting the riches of the Internet.

Developed last year by a team at the University of Illinois' National Center for Supercomputing Applications (NCSA), Mosaic has emerged as the killer application for the Internet — a user friendly interface for accessing multimedia information such as formatted text, graphics, audio and video.

Mosaic Communications' new Mosaic NetScape network navigator and Mosaic NetSite server add new security features and offer better performance than the NCSA version of Mosaic.

Who better to improve on the original than Mark Andreesen, the creator of the original NCSA Mosaic research prototype. Andreesen, who founded Mosaic Communications with James Clark, founder of Silicon Graphics Corp., brought with him many of the original team members that brought Mosaic to life.

Mosaic NetScape is available for popular desktop environments and is optimized to support links as slow as 14.4K bit/sec. The company claims it offers at least ten times the performance of the original NCSA prototype.

The Mosaic NetSite server line, designed to enable users to set up servers to distribute information, includes the NetSite Communications Server and the NetSite Commerce Server, both of which run on Unix-based platforms. The latter adds security features to the former, enabling customers to support a variety of electronic commerce scenarios. Both support HTTP-based clients and servers.

For more information contact Mosaic Communications at 800-Netsite or http://mosaic.mcom.com.

THE INTERNET INDEX

STATS AND FACTS ABOUT THE GRANDEST COLLABORATION SYSTEM OF THEM ALL

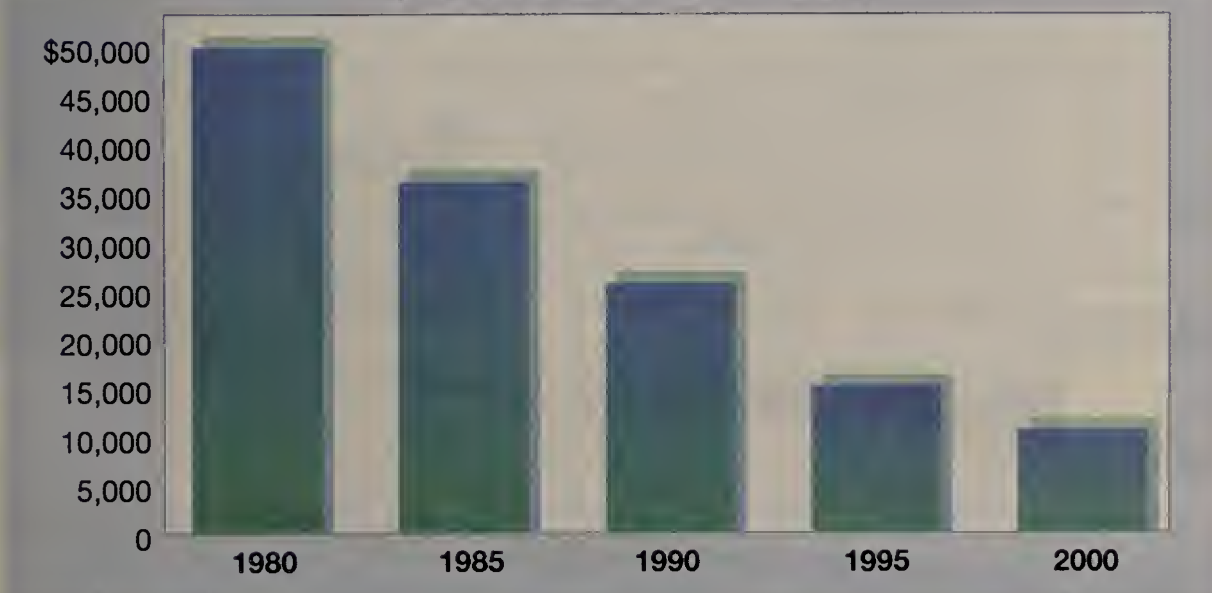
- Number of daily newspapers with Internet mail addresses: 54
- Number of TV and radio stations with Internet mail addresses: 62
- Percentage of PCs using TCP/IP in 1993: 3.9
- Sales of PC TCP/IP products in 1993: $272 million
- Number of daily comic strips that regularly include an E-mail address: 3
- Average number of megabytes of USENET news, per day: 172
- Estimated number of USENET sites: 180,000
- Estimated number of readers of news.announce.newusers: 800,000
- Estimated worldwide disk space used by USENET news: 61 terabytes
- Number of lawsuits over use of trademarks in domain names: 2
- Number of commerical domains reqistered between July 15 and August 15: 1,401
- Number of Internet retailers purchased by Home Shopping Network: 1
- Number of countries connected by IP: 75
- Number of countries connected by electronic mail: 152
- Number of subscribers to BITNET list of David Letterman's Top Ten List: 18,000
- Number of advisories issued by the Computer Emergency Response Team: 98
- Number of Internet access providers (U.S.): over 100
- Number of cable television companies providing Internet access: 1
- Number of Internet Request for Comments documents (RFCs): 1,697
- Number issued so far in 1994: 135

COMPILED BY WIN TREESE — TREESE@OPENMARKET.COM

The complete index: http://www.openmarket.com/info/internet-index/current.html

Imaging costs plummet

Imaging systems cost per seat



GRAPHIC BY TERRI MITCHELL

IDC/ADVANTE, FRAMINGHAM, MASS.

TRENDS IN LEADERSHIP

WHAT'S IN - LEADERS WHO:	WHAT'S OUT - LEADERS WHO
• COLLABORATE	• CONTROL
• COACH	• CRITICIZE
• CHECK-IN	• CHECK-UP
• INSPIRE IDEAS	• PROVIDE ANSWERS
• SHARE INFORMATION	• WITHHOLD INFORMATION
• EMPOWER	• DOMINATE
• DEVELOP	• ABDICATE
• ENCOURAGE PEOPLE	• JUDGE PEOPLE
• ADAPT TO SITUATIONS	• TREAT EVERYONE EQUALLY
• SHARE THE GLORY AND TAKE THE BLAME	• STEAL THE GLORY AND PLACE THE BLAME
• DELEGATE AND DEVELOP	• COMMAND AND CONTROL
• TAKE CHARGE OF THE GROUP AND EMPOWER THE INDIVIDUALS	• ABDICATE TO GROUP, DOMINATE INDIVIDUALS

From The Leader's Window: Mastering the four styles of leadership to build high-performing teams, by John Beck and Neil Yeager of Charter Oak Consulting, Inc., East Berlin, Conn.

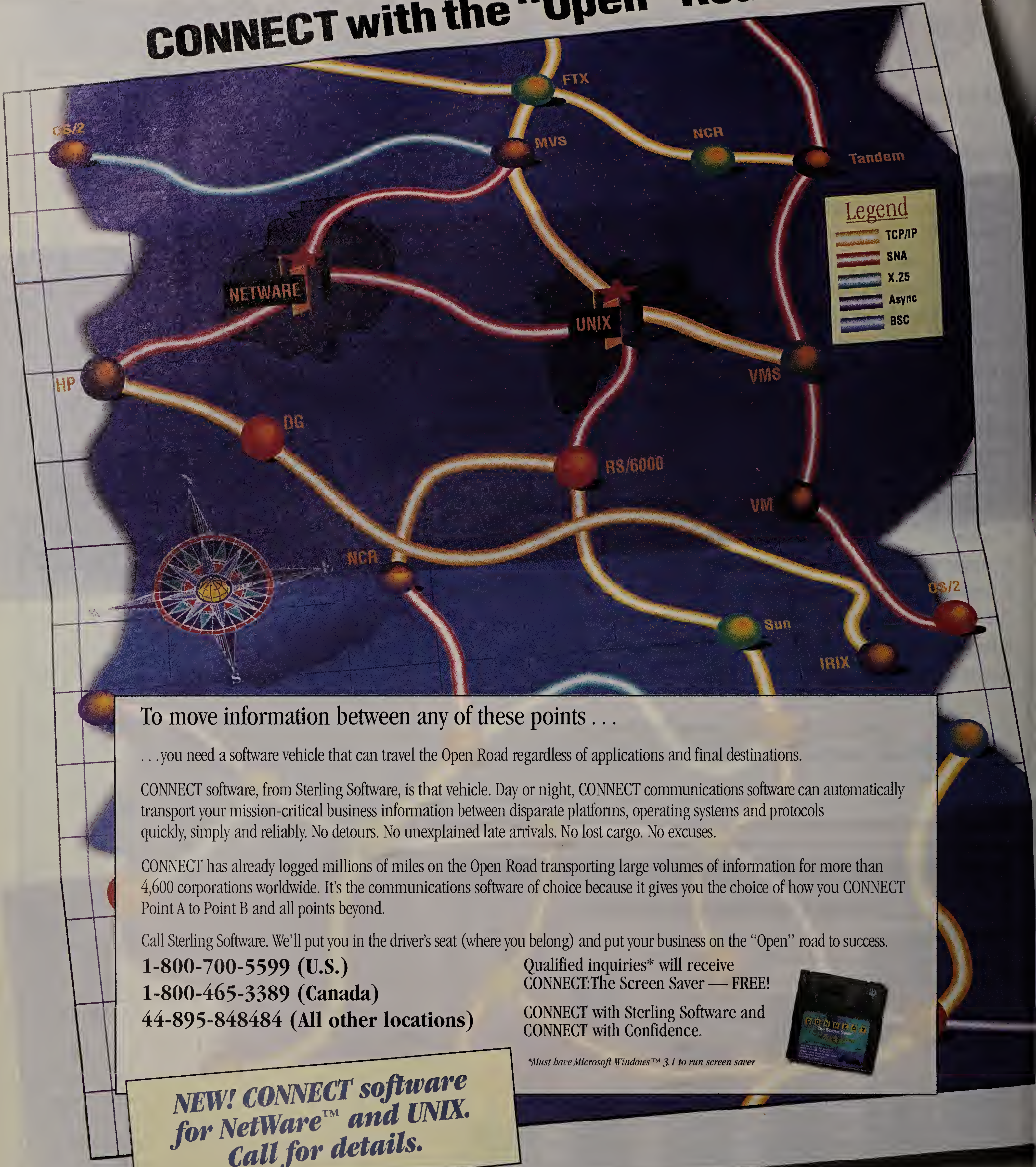
One fast gopher

If ATM is one of the secrets to unlocking collaborative computing doors, Indiana University's Internet Gopher server on the subject represents a virtual treasure trove of information for the forward thinking. It includes:

- The archives for the comp.dcom.cell-relay news group, the "IP over ATM" IETF working group and the "Routing over Large Clouds" IETF working group.
- ATM-related Request for Comments (RFCs) from the IETF.
- The ATM Frequently Asked Questions (FAQ) document.
- A large fully-abstracted bibliography of ATM research.
- Information on upcoming conferences, workshops and papers.
- Information on ATM vendors and products, including switches, adaptor cards, test equipment, board level products and multiplexers.
- A large collection of research papers in Postscript format from research institutions around the world.
- Links to other Gophers that are relevant to this field.

To access the server direct your Gopher client to: cell-relay.indiana.edu (port 70), or contact Allen Robel, Senior Network Engineer, Indiana University, 812-855-0962.

CONNECT with the "Open" Road



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Circle Reader Service #34

COLLABORATIVE COMPUTING'S SOFT UNDERBELLY

BY CHARLES WOOD

Two rising stars in a politically charged, fast growing Silicon Valley firm had it in for one another. Both were hard driving and deserving of promotion and neither wanted to report to the other.

One, however, was unwilling to sit back and simply let the best man win. Mr. X took matters into his own hands by using the company's calendaring system to schedule appointments and cancel others for his nemesis, Mr. Y.

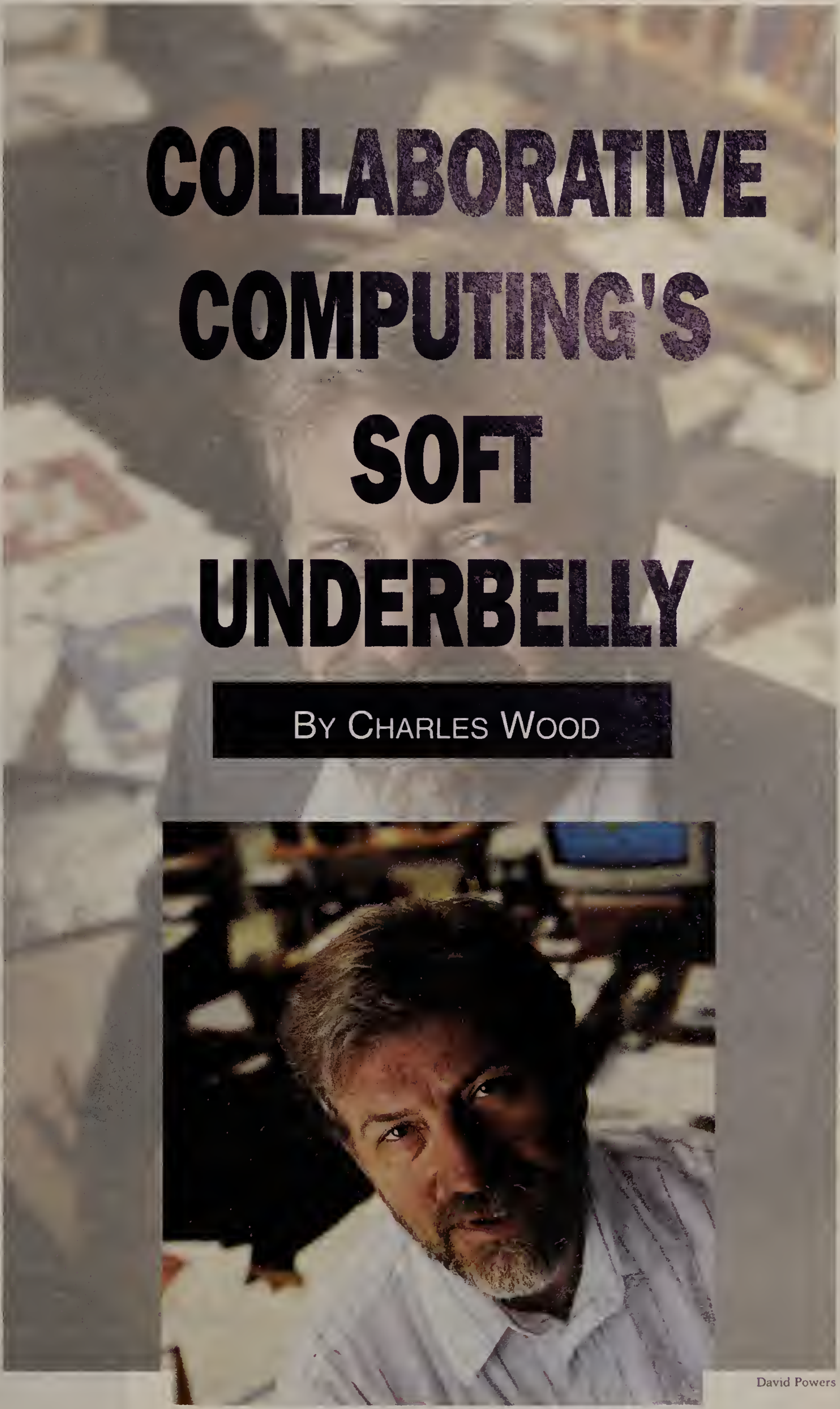
Mr. Y began missing important events and showing up for phantom meetings only to find a growing list of people, himself included, questioning his sanity. This rapidly eroded his credibility and ultimately resulted in the promotion of X.

Although the example is fictitious, the message is real. Collaborative computing environments raise a host of new security issues that should be examined now as the infrastructure is being deployed.

Of course that is rarely the way security is approached. History shows that management will typically only acknowledge the need for security after technologies have been adopted on a large scale and serious problems have been encountered.

The American cellular phone system provides one of many examples. Management within the cellular ranks didn't think much about security, and as a result the unique serial number used to identify each phone initiating a call is broadcast over the airwaves unencrypted. This allows crooks to intercept numbers and program them into their own phones and make calls that will be billed to someone else.

A study funded by IBM and performed at SRI International in Menlo Park, CA, showed that building controls into an application while it is still in development is 10 times less expensive than adding ▶



David Powers

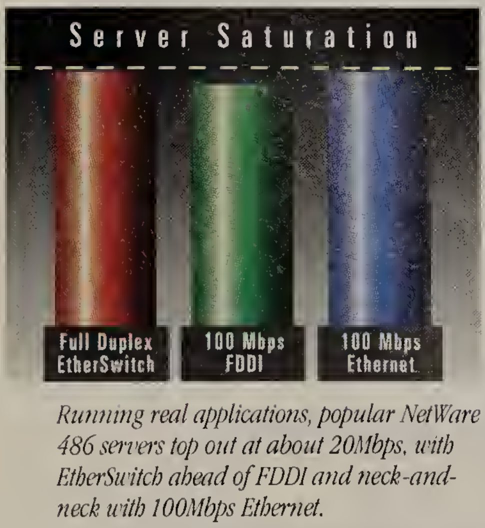
Earl Craighill, SRI: "There is a critical need to identify users and resources."

SECURITY TAKES ON A NEW MEANING WHEN YOU CONSIDER HOW THE NEW TOOLS CAN BE USED AND ABUSED.

WHY IS EVERYBODY TALKING ABOUT 100MBPS BUT BUYING KALPANA ETHERSWITCHES?

YOUR SKINNY LITTLE ETHERNETS CAN ACTUALLY OUTMUSCLE THE FAT PIPES.

Fact is, network performance is limited by what your servers can process. So you can squeeze as much or more out of them–about 20Mbps, tops–with EtherSwitches as you can with costly FDDI or 100Mbps Ethernet.



Running real applications, popular NetWare 486 servers top out at about 20Mbps, with EtherSwitch ahead of FDDI and neck-and-neck with 100Mbps Ethernet.

No wonder, with more than 100,000 ports delivered, Kalpana EtherSwitches have now become standard equipment on the LAN scape.

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They *cost less.* Start with our per-port price of about $500, factor in the number of users you can hook up to every one of our switched 10Base-T ports, and you wind up with, by far, the most cost-effective answer to your performance problems.

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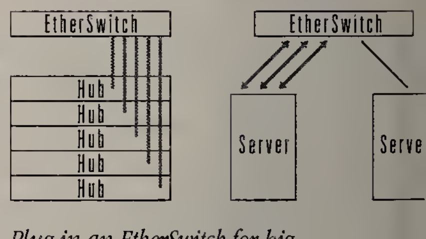
Our new Switch.NLM software balances the distribution of network traffic between two or more adapters in the same Novell server, boosting aggregate throughput to the server to more than 60 Mbps. Plus, if an adapter fails, Switch.NLM automatically reroutes traffic to the others.



Plug in an EtherSwitch for big performance boosts in stackable and multi-segment hubs or server clusters.

Instead of rolling the dice on a new infrastructure and an unsettled standard, you get the bandwidth you want *now* with what you already have in place. More bandwidth, in fact, than you can get with higher-speed shared technologies. No matter how much noise they make.

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- Plug-and-Play Simplicity
- SNMP Management

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For an immediate FAX-back response, call **(408) 749-1900, extension FAX**, and select the information you want from the document index. For a copy of Infonetics Research's "Server Bandwidth Congestion–Practical Limits; 10 Mbps versus 100Mbps Solutions", select document number 353.

yes
It runs with NetWare

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MARCH 1994

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NETWORK WORLD

The Newsweekly of Enterprise Network Computing

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Street Address City State Zip

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If government, please specify division: ______________________________

1 Industry: (check one only)

01 ☐ Manufacturers (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04 ☐ Healthcare Services
05. ☐ Hospitality/Entertainment/ Recreation
06. ☐ Media/TV/Cable/Radio/Print
07 ☐ Retail/Wholesale Trade/Business Services
08 ☐ Transportation
09 ☐ Utilities
10. ☐ Education
11 ☐ Process Industries (Mining/Construction/ Petroleum Refining/ Agriculture/Forestry)
12. ☐ Government Federal/State/Local
13. ☐ Military
14 ☐ Aerospace
15. ☐ Consultants (Independent)
16. ☐ Carriers/Interconnects
17. ☐ Manufacturers (Computer/ Communications)
18 ☐ Systems/Network Integrators (VAR/VAD/ VAN/Systems/Software Houses)
19. ☐ Distributors Communications/ Computers
20. ☐ Other ______________

2 What is your Job Function? (check one only)

NETWORK IS Management:

1 ☐ Networking Management
2 ☐ LAN Management
3 ☐ Datacom/Telecom Management
4 ☐ IS,IT,MIS,Systems Management
5. ☐ Engineering Management
6. ☐ Corporate Management (CIO,CEO,PRES,VP, DIR,MGR,Financial Management)
7. ☐ Consultant (Independent)
8. ☐ Other ______________

3 What is the total number of sites for which you have purchase influence? (check one only)

1 ☐ 100+
2 ☐ 59 - 99
3. ☐ 20 - 49
4 ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1
7 ☐ None

4 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. SCOPE (check one only)
1. ☐ Corporatewide
2 ☐ Multienterprise
3 ☐ Departmental
4 ☐ None

B. INVOLVEMENT (check all that apply)
1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4 ☐ Determine the need
5. ☐ None

5 Check ALL that apply in columns A and B:

A: I am involved in the purchase of the following products/services.
B: I plan to purchase the following products/services.

A B
☐ 100 ☐ **LOCAL AREA NETWORKS**
☐ 01 ☐ Local Area Networks
☐ 02 ☐ Network Operating Systems Software (NOS)
☐ 03. ☐ LAN Storage Devices (optical, tape, disk, etc.)
☐ 04 ☐ LAN Backup Systems (optical, tape, disk, etc.)
☐ 05. ☐ Network Test Equipment/Diagnostic/ Management Software
☐ 06. ☐ Hubs/Intelligent Hubs
☐ 07 ☐ Cables, Connectors, Baluns
☐ 08 ☐ UPS
☐ 09 ☐ Network Adapter Boards/Network Interface Cards
☐ 10. ☐ Peer-to-Peer LANs
☐ 11 ☐ Wireless Networks
☐ 12 ☐ SNMP Network Management
☐ 13. ☐ ATM Switches
☐ 14 ☐ Remote LAN Access
☐ 15 ☐ Ethernet Switches
☐ 16. ☐ LAN Servers
☐ 17 ☐ Superservers
☐ 18 ☐ Remote Access/Communications Servers

A B
☐ 101 ☐ **REMOTE/WIRELESS COMPUTING**
☐ 19 ☐ Laptops
☐ 20 ☐ Notebooks
☐ 21 ☐ PDAs
☐ 22 ☐ PCMCIA
☐ 23. ☐ Mobile Data Services
☐ 24 ☐ Wireless Data Services
☐ 25 ☐ Wireless Data Equipment

A B
☐ 102 ☐ **INTERNETWORKING**
☐ 26 ☐ Bridges
☐ 27 ☐ Routers
☐ 28 ☐ Gateways
☐ 29 ☐ Bridge/Routers

A B
☐ 103 ☐ **COMPUTERS/PERIPHERALS**
☐ 30 ☐ Micros/PCs
☐ 31 ☐ Minis
☐ 32 ☐ Mainframes
☐ 33 ☐ Workstations
☐ 34 ☐ Front-End Processors
☐ 35 ☐ Terminals
☐ 36. ☐ Printers
☐ 37 ☐ Cluster Controllers
☐ 38. ☐ Fax Machines
☐ 39 ☐ Monitors

A B
☐ 104 ☐ **SOFTWARE/APPLICATIONS**
☐ 40 ☐ Network Management
☐ 41 ☐ Systems Management
☐ 42 ☐ Micro to Mainframe
☐ 43 ☐ Security
☐ 44 ☐ Communication/Terminal Emulation
☐ 45 ☐ Word Processing
☐ 46 ☐ Operating Systems
☐ 47 ☐ Client Server Applications Development

A B **SOFTWARE/APPLICATIONS (cont'd)**
☐ 48. ☐ Applications Development
☐ 49. ☐ Data Base Management/RDBMS
☐ 50. ☐ Spreadsheet
☐ 51. ☐ Groupware
☐ 52. ☐ EDI
☐ 53. ☐ E-Mail
☐ 54. ☐ Windows/Graphical User Interface
☐ 55. ☐ 4GL Development/Case
☐ 56. ☐ Multimedia
☐ 57 ☐ Graphics/DTP
☐ 58. ☐ Remote Access
☐ 59. ☐ Imaging
☐ 60. ☐ Suites
☐ 61. ☐ Middleware
☐ 62. ☐ Document Management

A B
☐ 105 ☐ **WIDE AREA NETWORKS EQUIPMENT & SERVICES**
☐ 63. ☐ Modems (9.6K bps and over)
☐ 64 ☐ Modems (under 9.6K bps)
☐ 65 ☐ T-1/T-3 Multiplexers
☐ 66. ☐ T-1/T-3 Services
☐ 67 ☐ Inverse Multiplexers
☐ 68. ☐ Fractional T-1
☐ 69. ☐ SMDS
☐ 70. ☐ ATM (Asynchronous Transfer Mode)
☐ 71. ☐ Matrix Switches
☐ 72. ☐ Packet Switches
☐ 73. ☐ Protocol Converters
☐ 74. ☐ Diagnostic/Test Equipment
☐ 75. ☐ DSU/CSU
☐ 76. ☐ Microwave
☐ 77 ☐ Fax Boards/Modems
☐ 78. ☐ VSAT
☐ 79 ☐ Fiber Optic
☐ 80. ☐ Satellite
☐ 81. ☐ ISDN
☐ 82 ☐ PBXs (over 1000 lines)
☐ 83. ☐ PBXs (under 1000 lines)
☐ 84 ☐ Automatic Call Distributors
☐ 85. ☐ Voice Messaging Systems
☐ 86. ☐ Videoconferencing/Teleconferencing
☐ 87 ☐ Voice Response/Processing
☐ 88. ☐ Dedicated Leased Line
☐ 89 ☐ Switched Data
☐ 90. ☐ E-Mail/Online Services
☐ 91 ☐ Image Processing
☐ 92. ☐ 800/900 Services
☐ 93 ☐ WATS/MTS
☐ 94 ☐ International
☐ 95. ☐ Virtual Networks
☐ 96. ☐ Frame Relay
☐ 97 ☐ Value Added Services
☐ 98 ☐ CIT (Computer-Integrated Telephony)

☐ 99. ☐ None of the above (1-98)

6 What is the total number of LANS, Workstations/Nodes: At this Location/ In your Organization?

At This Location:	LANs		Workstations/ Nodes	Entire Organization:	LANs		Workstations/ Nodes
1.	☐	5000+	☐	1.	☐	5000+	☐
2.	☐	1,000 - 4,999	☐	2.	☐	1,000 - 4.999	☐
3.	☐	100 - 999	☐	3.	☐	100 - 999	☐
4	☐	50 - 99	☐	4.	☐	50 - 99	☐
5.	☐	10 - 49	☐	5.	☐	10 - 49	☐
6.	☐	9 or less	☐	6.	☐	9 or less	☐
7.	☐	None of the above	☐	7.	☐	None of the above	☐

7 Check ALL that apply in columns A and B:

A: The following network platforms are currently installed.
B: The following network platforms are currently planned.

A B
☐ 55 ☐ **NETWORK ARCHITECTURES**
☐ 01. ☐ SNA
☐ 02. ☐ DECNET
☐ 03. ☐ MAP/TOP
☐ 04 ☐ TCP/IP
☐ 05. ☐ DCA (Unisys)
☐ 06. ☐ X.25
☐ 07. ☐ Novell IPX/SPX
☐ 08. ☐ APPC/APPN/LU6.2
☐ 09. ☐ NETBIOS
☐ 10. ☐ OSI
☐ 11. ☐ APPLETALK
☐ 12. ☐ NSF
☐ 13. ☐ XNS
☐ 14. ☐ OTHER ______________

A B
☐ 56 ☐ **NETWORK OPERATING SYSTEM**
☐ 15. ☐ LOCALTALK (APPLETALK)
☐ 16. ☐ BANYAN (VINES)
☐ 17. ☐ DCA (IRMALAN)
☐ 18. ☐ DCA (10-NET)
☐ 19. ☐ IBM (LAN SERVER)
☐ 20. ☐ IBM (PC LAN PROGRAM)
☐ 21. ☐ MICROSOFT (LAN MANAGER)
☐ 22. ☐ NOVELL (NETWARE, 2X, 3X, 4X)
☐ 23. ☐ PROTEON (PRONET)
☐ 24. ☐ 3COM (3+, 3+OPEN)
☐ 25. ☐ ARTISOFT (LANTASTIC)
☐ 26. ☐ HAYES (LANSTEP)
☐ 27. ☐ DEC (PATHWORKS)
☐ 28. ☐ WINDOWS NT/ADVANCED SERVER
☐ 29. ☐ OTHER ______________

A B
☐ 57 ☐ **LAN ENVIRONMENT**
☐ 30. ☐ 4M TOKEN RING
☐ 31 ☐ 16M TOKEN RING
☐ 32. ☐ ARCNET
☐ 33. ☐ ETHERNET
☐ 34. ☐ 100 M ETHERNET
☐ 35. ☐ STARLAN
☐ 36. ☐ FDDI
☐ 37. ☐ LOCAL TALK
☐ 38. ☐ 10BASE-T
☐ 39. ☐ ATM
☐ 40. ☐ OTHER ______________

A B
☐ 58 ☐ **COMPUTER OPERATING SYSTEM**
☐ 41 ☐ DOS
☐ 42. ☐ UNIX/XENIX/AIX
☐ 43. ☐ OS/2
☐ 44. ☐ OS/2.X
☐ 45. ☐ IBM MVS
☐ 46. ☐ IBM VM
☐ 47. ☐ DIGITAL VMS
☐ 48. ☐ MACINTOSH
☐ 49. ☐ WINDOWS
☐ 50 ☐ WINDOWS NT
☐ 51 ☐ X WINDOWS
☐ 52. ☐ SOLARIS
☐ 53. ☐ OTHER ______________

☐ 54 ☐ None of the above (1-53)

8 For which areas outside of the U.S. do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

9 Which of the following hardware platforms are installed/planned in your company? (check all that apply)

	Mainframes		Minis			Mainframes		Minis	
	Installed	Planned	Installed	Planned		Installed	Planned	Installed	Planned
01. IBM	☐	☐	☐	☐	06. DATA GENERAL	☐	☐	☐	☐
02. DIGITAL	☐	☐	☐	☐	07. HP	☐	☐	☐	☐
03. AMDAHL	☐	☐	☐	☐	08. TANDEM	☐	☐	☐	☐
04. AT&T	☐	☐	☐	☐	09. UNISYS	☐	☐	☐	☐
05. BULL HNIS	☐	☐	☐	☐	10. OTHER ______	☐	☐	☐	☐

Which of the following do you have installed/planned: (USE NUMBERS ONLY)

	At This Location		Entire Organization	
	Servers	Clients/Nodes	Servers	Clients/Nodes
11 POWER MACINTOSH				
12 MACINTOSH OTHER				
13. POWER PC BASED				
14. PENTIUM BASED				
15. 80486 BASED				
16. 80386 BASED				
17. 80286 BASED				
18. 80806/80808 BASED				
19. ALPHA BASED				
20. RISC/UNIX BASED WORKSTATIONS				
21. OTHER				

10 What is the estimated value of networking equipment and services that you help specify, recommend or approve annually? (check one only)

01 ☐ $100 million and over
02 ☐ $50 - $99 9 million
03 ☐ $25 - $49.9 million
04. ☐ $20 - $24 9 million
05. ☐ $10 - $19 9 million
06. ☐ $5 - $9.9 million
07. ☐ $1 - $4 9 million
08 ☐ $500,000 - $999,999
09. ☐ $499.999 or less
10. ☐ None of the above

11 Estimated gross annual revenues of your entire company/institution: (check one only)

1. ☐ Over $10 billion
2 ☐ $1 to $9.9 billion
3 ☐ $500 to $99 9 million
4. ☐ $100 to $499.9 million
5 ☐ $50 to $99.9 million
6 ☐ $10 to $49.9 million
7 ☐ $5 to $9 9 million
8 ☐ $4.9 million or less
9 ☐ None of the above

12 Estimated number of employees: At This Location/In Entire Organization.

At This Location:
1 ☐ Over 10,000
2. ☐ 5,000 - 9,999
3 ☐ 2,500 - 4,999
4 ☐ 1,000 - 2,499
5 ☐ 500 - 999
6 ☐ 499 or less

Entire Organization:
1 ☐ Over 10,000
2 ☐ 5,000 - 9,999
3 ☐ 2,500 - 4,999
4 ☐ 1,000 - 2,499
5. ☐ 500 - 999
6 ☐ 499 or less

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controls after the application has gone into production.

But before appropriate collaborative computing controls can be selected, organizations must perform risk assessments. "Organizations need to come to terms with their own needs," says David Coleman, principal consultant at Collaborative Strategies in San Francisco. Such assessments should examine things like fraud, service interruption, data integrity corruption, industrial espionage, sabotage, terrorism, errors and omissions and privacy violation.

Collaborative computing also introduces unique security issues. "By definition, it involves shared space," said Rich Byron, a marketing representative for groupware vendor QDM in North Andover, MA. But when people think of security they think of restrictions — a seemingly antithetical philosophy.

Ronni Marshak, editor-in-chief of the Workgroup Computing Report published by the Patricia Siebold Group in Boston, says collaborative computing users "generally haven't thought about information sharing much, and as a result they often set permissions too broadly." Beyond user passwords, groupware packages such as Lotus Development Corp.'s Notes provide access control lists to define the type of information sharing required.

Information ownership is another nebulous area which needs to be clarified before collaborative computing systems are implemented. More specifically, organizations need to define information owners, as well as the rights and responsibilities that ownership implies. Do individuals or organizations own the information. If this question isn't answered, "People may feel like their privacy is violated," Marshak says.

ENCRYPTION INSURANCE

In the absence of clear management direction about security, many users of collaborative computing systems inadvertently disclose information that should have been kept confidential. Users may, for example, put information in a shared directory on a server when they should have kept it in a personal directory on their own hard drive.

These training problems are particularly pronounced when people from more than one organization use a collaborative computing system, as is often the case with virtual corporations. As companies knit together teams based on contractors, consultants, temporaries and other outsiders, "employees" become more loyal to themselves than they are to the organization, says Coleman. "With less control over the participants, the opportunity for mayhem is greater."

The true identity of collaborative computing users may also be problematic. According to Earl Craighill, program director of augmented collaboration environments at SRI International, "There is a critical need to identify the users and also the resources."

Craighill is particularly concerned about shared processes or software agents that are sent from one machine to another, especially over low-security networks such as the Internet. These resources may indicate certain originating addresses, but most often there is no reliable mechanism to validate their sources.

"Collaborative computing users generally haven't thought about information sharing much, and as a result they often set permissions too broadly."

RONNI MARSHAK
SIEBOLD GROUP

"Consider an agent that is sent to your stockbroker's computer to negotiate a purchase for you," Craighill says. "How does your stockbroker know that this agent is not a Trojan Horse, and how do you know that your stockbroker's computer will follow your instructions correctly?"

Encryption would address some of the problems posed by Craighill. Encryption can conceal information from unauthorized eyes and verify that the information was sent from a certain party, was received by a certain party, and that it was not modified in transit.

Craighill sees public-key cryptography as an important tool for providing these functions, as well as others such as message time-stamping. Only when these encryption-based functions are in place can companies begin to tear down the firewalls they have hastily erected to achieve some level of security. "The firewall approach is just too restrictive to support advanced collaborative functions," said Craighill.

LACK OF STANDARDS

The standards and application programming interfaces (APIs) for encryption in collaborative computing are still largely unspecified. Some sort of central control will probably be necessary if "crypto-anarchy" is to be avoided.

Crypto-anarchy — a significant expansion of lawless behavior concealed using personal encryption systems — could be fostered by networks able to provide sender/receiver anonymity, message path untraceability, and blinded digital signatures.

Although still highly speculative, crypto-anarchy could have a profound effect on both society and business. (For more information, see Kevin Kelly's book entitled *Out of Control,* (Addison-Wesley, 1994.)

The notion of a "well-formed transaction" will also increasingly be integrated into collaborative computing systems.

A transaction is well formed if it follows a set of previously defined security rules. For example, one such rule might specify that users cannot use a utility software package to update databases directly; they can only do updates via a DBMS, which includes suitable access control restrictions.

Groupware systems should have a formal mechanism for delegating access privileges and logging these events for security purposes. The well-formed aspect refers to rules that must be observed for a transaction to be accepted by the system.

Well-formed transactions have many other important implications for collaborative computing. With respect to the processing of insurance claims, these action-forcing mechanisms could define the ways that a claim is handled.

Shirish Hardikar, vice president of marketing at groupware ven- ▶

The importance of minding the store

The replication function of Lotus Development Corp.'s Notes is one of its most powerful features — letting workgroups and users across an enterprise quickly exchange information.

But it can also be a dangerous tool if left unchecked, as consulting firm Arthur Andersen & Co. learned in April.

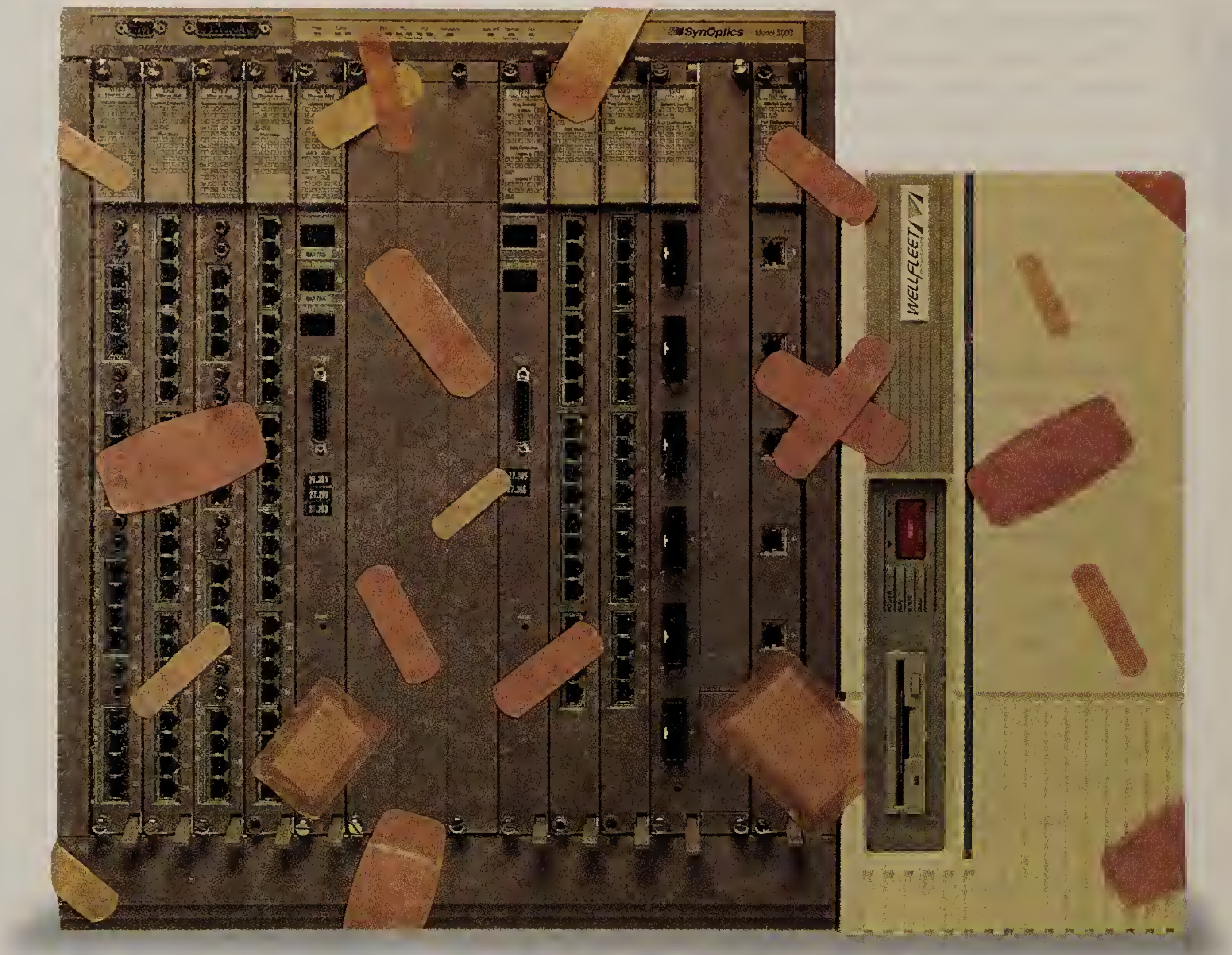
A network operator developing an application at the firm's Chicago headquarters managed to delete most of the entries in the server's user directory, the Name and Address Book. That night, the newly shrunken director was replicated across Andersen's entire worldwide Notes network, which connects more than 30,000 users.

Andersen learned two lessons from the experience. One is to never use production Notes servers for development work — applications should be built on test networks before being rolled out.

And two, it was reminded of the importance of backing up servers.

Fortunately for Andersen, the firm had already instituted a back-up policy, which let its offices quickly restore most of the entries in local user directories. Some other companies, however, rely on Notes replication as their back-up policy, figuring that if a local server database becomes corrupted, it will be restored at the next scheduled replication.

— BY ADAM GAFFIN



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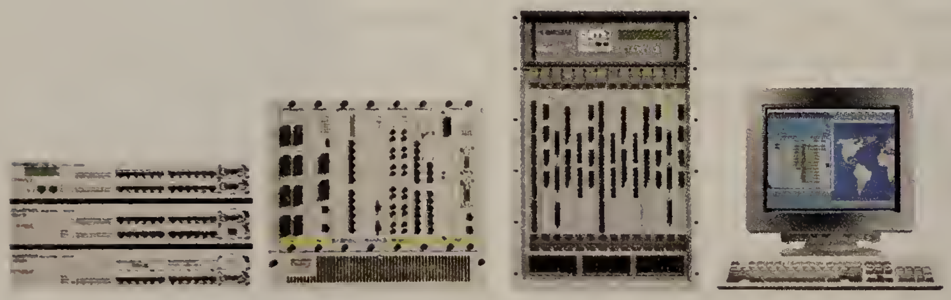

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BANDWIDTH SOLUTION

dor Action Technologies in Alameda, Calif., says one method to ensure a process will be completed properly once it has been started would be to "prevent other people from disrupting the transaction before certain authorized people have acted on it."

This might involve forcing a signature — or the electronic equivalent thereof — before further work takes place. Byron indicated such transactions might also be time sequenced, perhaps giving users messages like: "You can't do that until next Tuesday."

From the security standpoint, a well-formed transaction might additionally be required to go through certain channels, such as through application software that includes separation-of-duty controls. If system utilities were used to directly modify this application's files, in effect circumventing application controls, this would be readily detected and reported.

OTHER OPTIONS

Yet another promising way to achieve security in future collaborative computing systems will be object encapsulation. With this approach, access control and other security instructions could automatically accompany a document as it was used in object-oriented environments.

For instance, when two document objects are combined, the resulting object could take on the highest data classification level of the two. Marshak indicated that the inheritance process now used by some collaborative computing systems sometimes generates dysfunctional results. This is because they involve application encapsulation rather than document encapsulation security approaches.

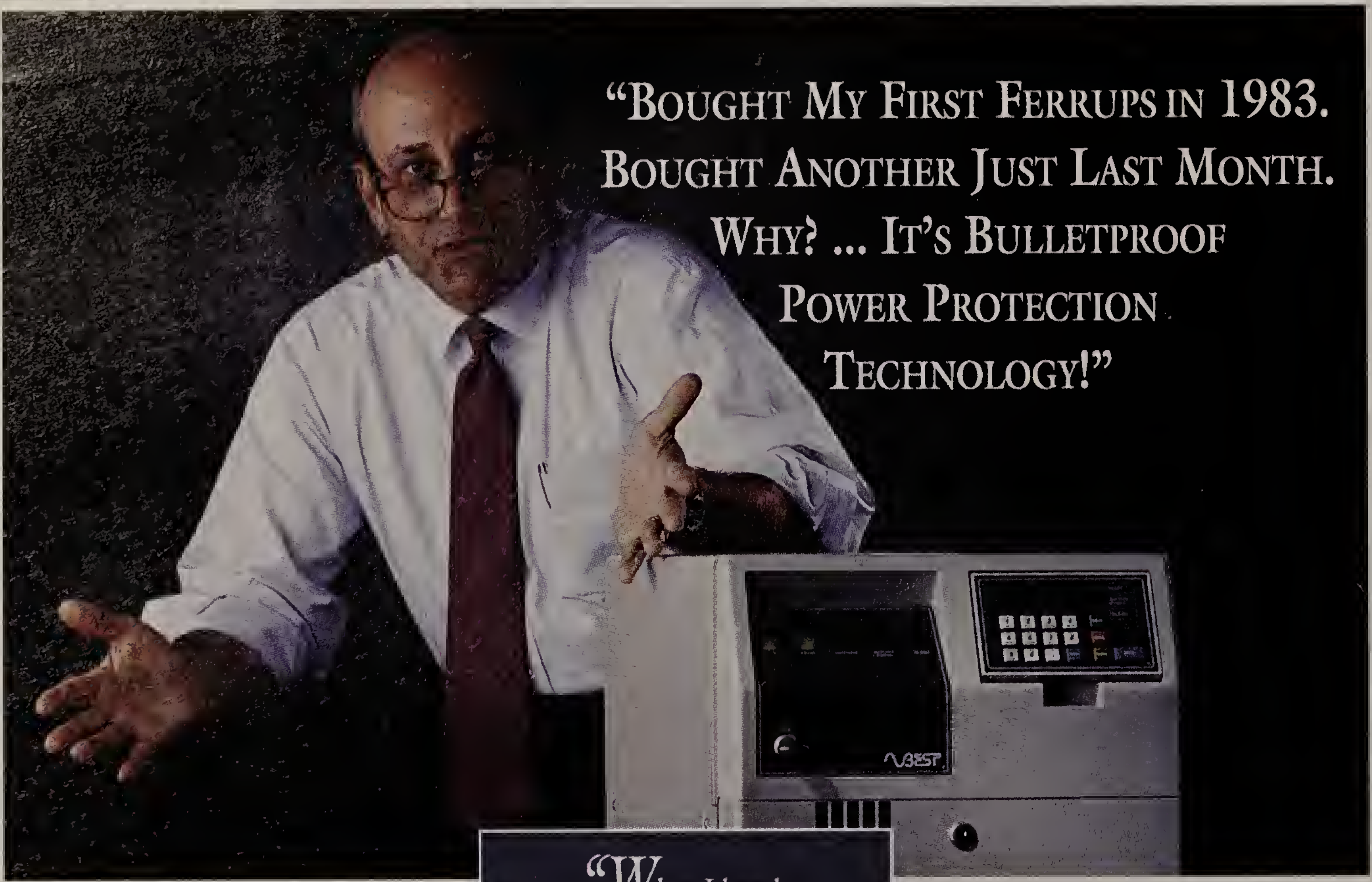
If a document object with a link to a spreadsheet were shared with another person, for example, this link might inadvertently provide the other person with spreadsheet privileges they were never intended to have. Making inheritance of security privileges explicit rather than implied would help prevent this problem.

Automated auditing of collaborative computing systems is also expected to assist with these complex technical security issues. Craighill expects systems and agent based technology to be used to examine user and process behaviors to detect problems before they get out of hand.

Although it's tempting, users should be cautious about the things they automate. Systems administrators are so often pressed to handle a myriad of tasks that it is tempting to automate activities that should not be automated. Destructive actions, such as deleting a database of user privileges, should require human approval before execution (see sidebar).

User organizations need to actively tailor collaborative systems to their own business needs, and then continuously monitor these systems to make sure the systems are operating appropriately.

Wood is an independent information security consultant in Sausalito, Calif., and author of Information Security Policies Made Easy (Baseline Software, 1994). You can reach him via the Internet at 3143490@mcimail.com.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Circle Reader Service **#31**

By David Chappell

OLE taunts

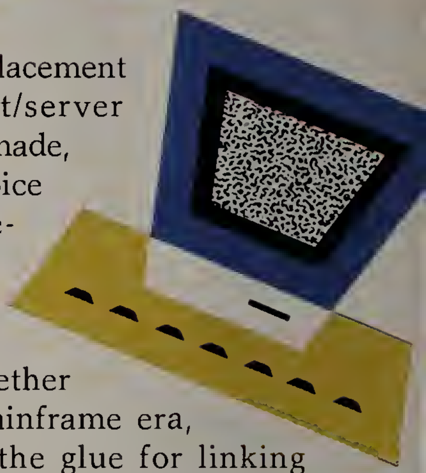
IBM's Systems Network Architecture is a cornerstone of Western civilization. Banks, insurance companies and many other kinds of organizations have based their business on IBM mainframes, a choice that unavoidably led to a dependence on SNA.

This has by no means been a bad thing. In fact, the primary reason for the success of IBM mainframe-based systems has been that they solved customer problems in an effective, reliable way. They were the safe choice; no one ever got fired for buying IBM.

But the world has changed. Today you can get fired for buying IBM. The growth of mainframe-based, SNA-oriented networks has slowed greatly.

Now, organizations are venturing forth in very small boats onto the treacherous waters of client/server computing. The reasons are entirely rooted in the need to effectively solve business problems; lighthearted surfing on the waves of technology trends has always been anathema to most IS decision makers.

The goal is the same as ever — provide the best possible systems for an organization at the lowest cost. Nothing has emerged as the obvious "safe" choice as the replacement for SNA in the client/server world. A case can be made, however, that that choice will ultimately be derived from Microsoft Corp.'s OLE.



In the same way that SNA stitched together applications in the mainframe era, OLE may emerge as the glue for linking applications in the age of client/server-based collaborative computing.

The Microsoft technology may emerge as the glue for linking applications in the age of client/server-based collaborative computing

DEFINING OLE

How can OLE possibly be compared to SNA?

Answering that question requires explaining what OLE really is, something Microsoft has not done very well.

OLE's roots are in the world of compound documents. Users of so-called personal productivity applications like word processors and spreadsheets wanted to create documents that combined information from both sources.

Placing a Lotus 1-2-3 spreadsheet in a Microsoft Word document is a relatively straightforward accomplishment — just copy the bytes from place to place. What users really wanted, though, was

SNA to bullfight

Robert Pizzo

the ability to embed the spreadsheet such that when a document was opened and the spreadsheet selected, 1-2-3 would become active and allow in-place editing of that spreadsheet.

Microsoft's initial attempt at providing an infrastructure to support this was OLE 1. This first OLE release worked well enough, but in what has become the traditional Microsoft style, it was really just a precursor to the main event: OLE 2.

In trying to improve upon OLE 1, Microsoft engineers wound up creating much more than a compound document architecture. OLE 2 still supports compound documents, but the most interesting and arguably most important technological fallout from OLE 2 has no intrinsic connection at all with compound documents. It's the underlying object model, dubbed COM.

MAKING SENSE OF COM

The acronym COM originally stood for "Component Object Model." Microsoft, with input from Digital Equipment Corp., has enhanced the original Component Object Model to create the Common Object Model. This second effort is essentially a superset of the first, and the acronym COM is used for both. Confusing? Absolutely, but in the welter of OLE-related concepts this slight disorientation is small potatoes.

The purpose of COM can be inferred from its original name: the creation of reusable software components. Those components can be as small as a set of routines to manipulate character strings, as large as an entire application or some size in between. But whatever their size and purpose, all component objects are defined in much the same way.

Perhaps the most basic notion in COM is the idea that all communication between objects occurs through some kind of interface. Microsoft has defined a binary standard for interfaces, which means that objects can be written in any language so long as they present the appropriate interface structure to the outside world. COM also includes an Interface Definition Language (IDL) for defining interfaces more formally.

Every COM object must support at least one standard COM interface, and most will support more. Providers of COM objects are also, of course, free to define their own interfaces, providing any services they wish to other components. In fact, OLE's compound document features are provided by essentially converting applications into COM objects that support certain well-known interfaces. COM itself provides the services required for one COM object to locate, activate, and communicate with others.

Not surprisingly, COM's potential users are expressing interest in the technology. Bill Estrem, project leader of 3M's Information Architecture group in St. Paul, Minn., says, "We're looking at various object models. Since we see Microsoft systems as being a significant part of our future architecture, we think COM will be important to us."

THE POINT OF COM

COM is Microsoft's attempt at achieving what has become the Holy Grail of software development: reuse.

Rather than thinking of applications as monoliths, Microsoft is instead encouraging developers to view them as groups of discrete components, each defined as a COM object supporting appropriate interfaces.

Don't like the spell checker in a particular word processor? If it's a component object, replace it with another one.

TRADITIONAL METHOD

More traditional strategies for reuse revolve around object-oriented languages like C++. In general, though, these approaches don't provide binary compatibility. Instead, they require all components to be developed in the same language, often using the same compiler.

Microsoft argues that this kind of single-minded approach is impractical for the diverse environments faced by Windows and ▶

By any other name ...

OLE, pronouced like the bullfighter's salute, is an acronym for Object Linking and Embedding. As Microsoft's work on OLE has progressed, however, many of the technologies created under the OLE banner have had nothing to do with linking or embedding objects. But now the acronym became too well known to replace.

Microsoft's solution was to stop treating this three-letter label as an acronym. Officially, it has no expansion anymore; it no longer stands for Object Linking and Embedding. Instead, the term OLE refers to a family of technologies. While they share a common heritage, the members of this family solve a variety of problems, many unrelated to the original goals of OLE.

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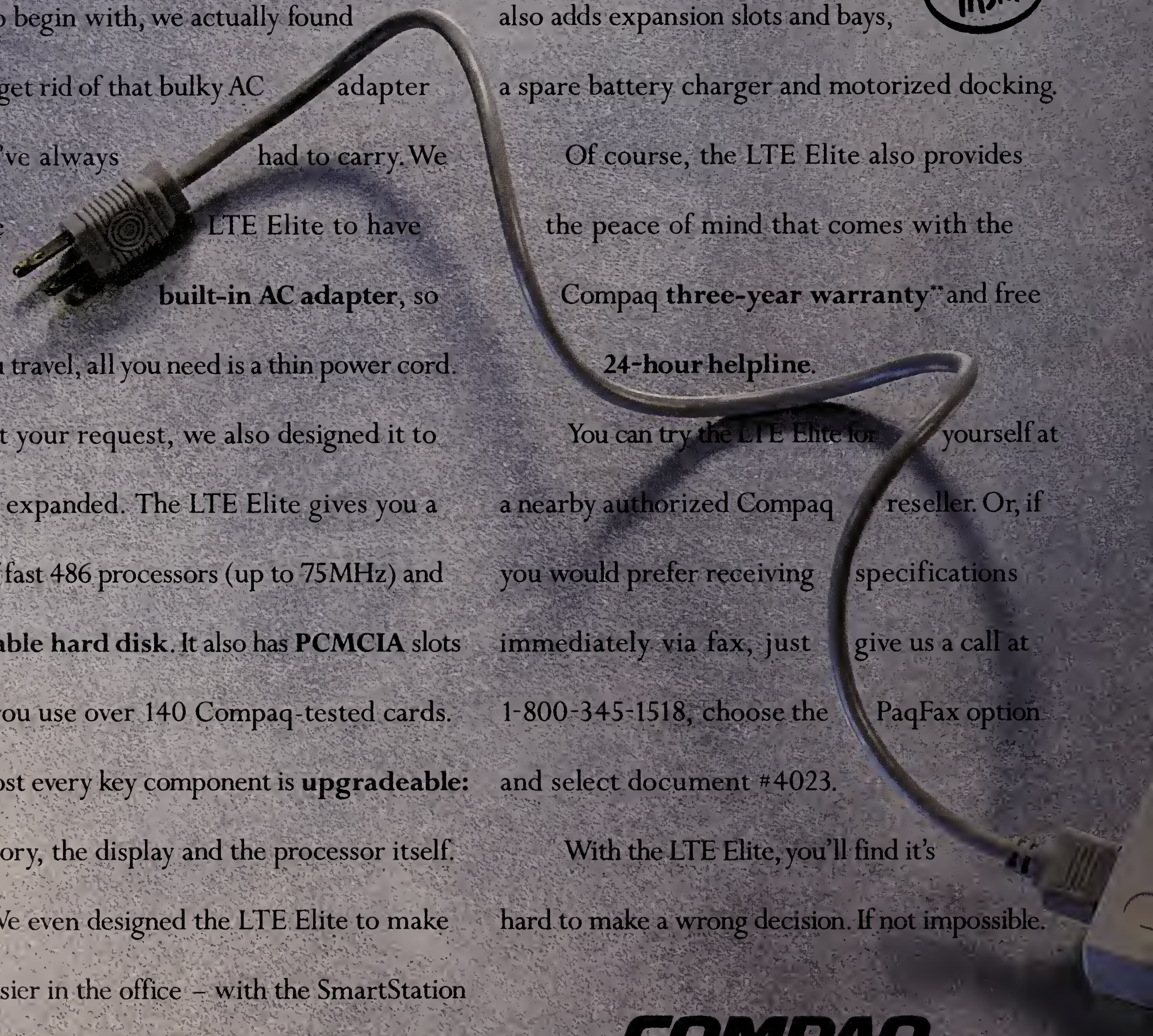

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Windows NT. Instead, COM's definition of a binary standard for object interfaces completely separates COM objects from dependence on any particular programming language. (Microsoft can't take all the credit for this innovation — IBM's System Object Model, takes a similar approach and has been available for some time.)

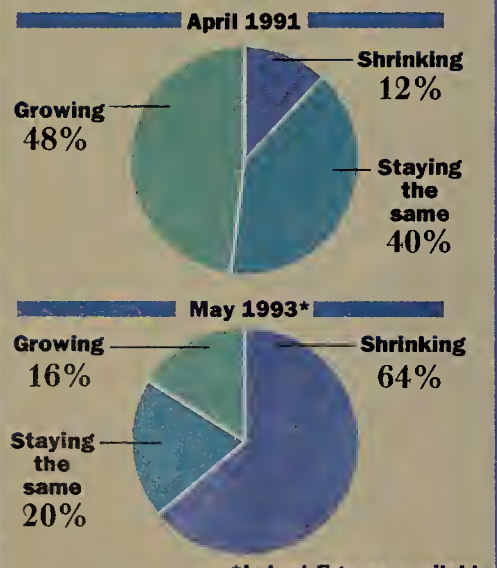
One more important point: while powerful COM objects can be quite challenging to create, they are not, in the main, terribly difficult to use. Although not required, Microsoft has defined COM such that C++ is the easiest language in which to create component objects. But requiring all of an organization's Cobol programmers to become C++ programmers is asking for trouble.

One way to avoid the problem while retaining the benefits of reuse and relatively quick application development is to create a set of key business objects in C++ using COM.

The creators of these objects will typically be an organization's rocket scientists, comprising a small subset of the total number of application developers. Other developers can then make use of these objects to create appropriate applications.

Withering SNA

Is your SNA net growing, shrinking or staying the same size?



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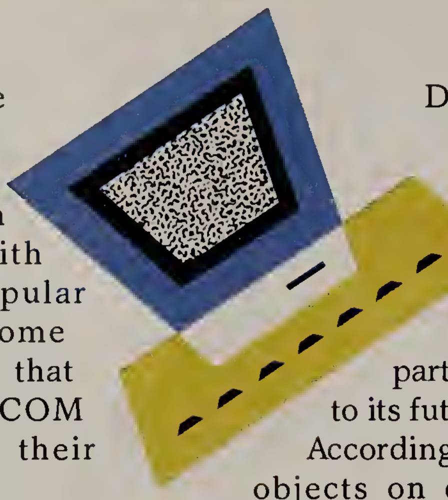
The primary concern of this second group is combining existing business objects in useful ways behind effective user interfaces. Accordingly, one might expect them to work with Microsoft's popular Visual Basic or some other environment that can easily use COM objects but hides their internal complexity.



In fact, many new versions of off-the-shelf applications such as Excel are themselves constructed as a set of COM objects, and so applications can be built that freely mix a business's custom components with those contained in standard applications.

How important is COM to Microsoft? According to Microsoft program manager Mark Ryland, "It's not an exaggeration to say that COM is central to Microsoft's strategy in virtually every area of our business."

ENTER DISTRIBUTION

So far, COM has been described as a way to create applications on a single system, a characterization that is exactly correct today.

Sometime in 1995, however, Microsoft plans to ship to customers distributed support for COM (developers have had access to this feature for some time). With distribution, a COM object can access services provided by another COM object on a remote system. The day that COM becomes distributed is the day that its potential grip on the client/server market begins.

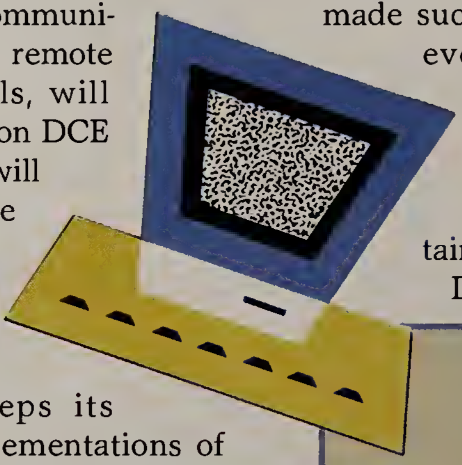
In the heyday of SNA, IBM could essentially require customers to buy everything in a blue box. Not even Microsoft has managed to wield that kind of power. Multivendor environments are the norm, a norm that shows no signs of changing.

Indeed, according to Ryland, Microsoft "must make COM a cross-platform technology in order to ensure its widespread adoption and success, and we are very serious about making this happen."

But how can an entirely proprietary technology like COM dominate in an open distributed world?

The answer: it uses (or less charitably, co-opts) a key piece of that openness. COM's distribution is accomplished by relying on the Open Software Foundation's Distributed Computing Environment (DCE). DCE is supported today by all major vendors, and Microsoft has designated parts of DCE as strategic to its future.

According to Microsoft, COM objects on different systems will communicate using DCE remote procedure calls, will be able to rely on DCE security, and will be able to use DCE's directory services to locate one another. If Microsoft keeps its promises, implementations of COM should be able to interoperate across multiple vendor platforms using the widely supported DCE standard.



The argument for COM's eventual dominance, then, goes like this: the Windows operating system is becoming the dominant client platform in virtually all organizations and within a few years the Windows environment is likely to consist of nothing but COM components combined in interesting ways.

Since COM provides distributed support in a straightforward manner — indeed, it can often be transparent to the objects involved — it will be the easiest way to write a client/server application for Windows. Client/server applications that use COM will be able to incorporate other COM objects at will, and so building powerful solutions to complex problems ought to become simpler.

THE CASE FOR COM

The argument isn't quite as strong on the server side. No one, not even Microsoft, claims Windows will become dominant on servers. Newly installed application servers tend to run one of two operating systems: Windows NT or some flavor of Unix.

For servers running Windows NT, once again COM is a natural. Indeed, by the Cairo release of NT, due in late 1995, the operating system itself will become a set of COM components yoked together to provide support for applications. COM client objects on Windows talking to COM server objects on NT will provide a very cozy, although wholly proprietary, application environment.

For Unix, the picture is more complicated. Microsoft has not announced plans to directly support COM on platforms other than Windows, Windows NT, and the Macintosh. Third parties have made such announcements, however, ranging from small software companies to large organizations like Digital.

COM on Unix will certainly be available, and via Digital, on other systems as well. Given COM's reliance on DCE for distribution, possible for COM-based clients to access DCE servers, an option that obviates the need for COM itself on server platforms.

> Within a few years the Windows environment is likely to consist of nothing but COM components combined in interesting ways

There's one more key system to be addressed: IBM's MVS. Mainframes and the data they contain are and will probably remain the heart of many organizations' computing environments. Can applications written using COM get access to this crucial piece of the puzzle?

The answer remains to be seen. Waiting for IBM to provide direct

CONTINUED ON PAGE 27 ▶

IS BIG, BAD ATM OVER PUMPED?

BY MARY PETROSKY

With its ability to support any type of traffic, operate at virtually any speed and reach from the desktop across the wide area, Asynchronous Transfer Mode (ATM) has the potential for brillance.

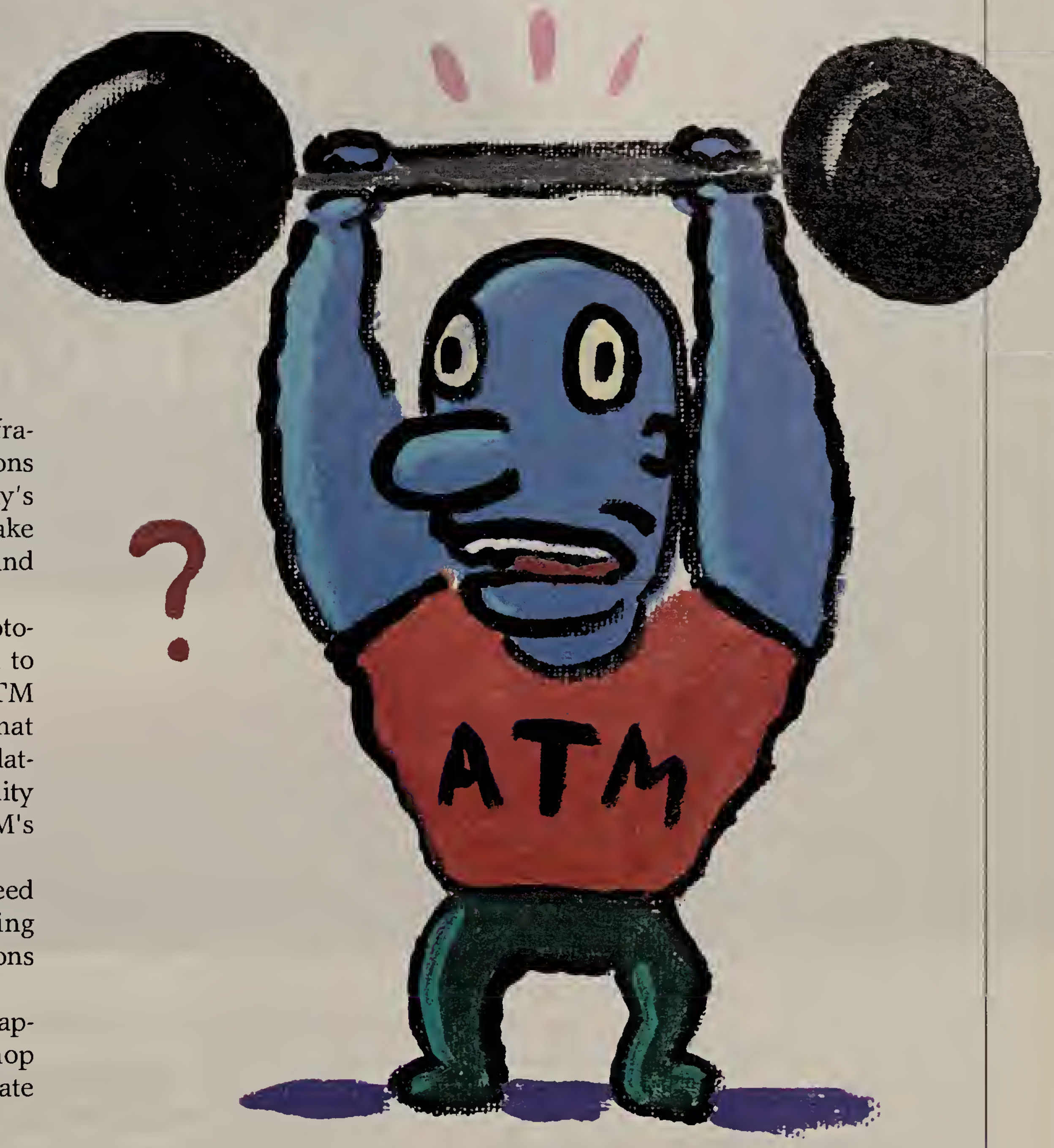
But much must change before ATM's potential as an infrastructure for emerging collaborative computing applications can be exploited. Because ATM is so different from today's LAN technologies, it will be years before applications can take full advantage of ATM's power to integrate data, voice and video.

ATM's real benefits won't be tapped until transport protocols and network operating system interfaces are modified to enable applications to inform the protocol stack and ATM adapter driver how much bandwidth is needed and what quality of service is acceptable for each connection. The latter includes things like the speed, accuracy and dependability with which cells are delivered (see "Quality of Service: ATM's Elusive Shine" page 24).

In the short run, ATM will simply be used as a high-speed transport — a fatter pipe to move data around — meaning users will need to be able to run existing LAN applications over ATM.

There are two basic approaches for this. One is to encapsulate 802.X packets, such as Ethernet packets, and chop them into ATM cells. The other approach is to encapsulate network-layer protocols.

The ATM Forum is doing the former, defining a specification known as LAN emulation which makes the ATM net ▶



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look like an 802.X network to the protocols and applications above it. For desktop computers, LAN emulation software will come bundled with ATM adapters along with device drivers and signaling software.

These adapters will work with emulation servers which handle the translation of MAC addresses to ATM addresses, as well as support broadcast and multicast functions. This server software could run on an ATM switch, a file server, or another machine on the network.

Since the point of LAN emulation is to hide the ATM network, current driver interface specifications — such as Microsoft Corp.'s Network Device Interface Specification (NDIS) and Novell, Inc.'s Open Data-link Interface (ODI) — won't have to change, nor will higher layer protocols such as TCP/IP and SPX/IPX.

Likewise, since the applications relying on LAN emulation won't know about bandwidth and quality of service parameters, the LAN emulation software will simply ask the switch for best-effort service, using an unspecified quality of service.

The ATM Forum expects to publish the LAN emulation specification in early 1995. Products that conform to the spec — and which are interoperable — will probably appear in the second half of 1995. In the meantime, several vendors, including Fore Systems, SynOptics Communications, and IBM are offering proprietary implementations of LAN emulation. Fore, for example, is offering LAN emulation that works with NDIS 3.0 (supported in Windows NT 3.5 and Chicago) and ODI.

Novell is among the vendors waiting for the formal spec before delivering its LAN emulation server for NetWare and LAN emulation drivers for NetWare servers and clients. Novell is looking to support IPX, IP, and AppleTalk in its first release of LAN emulation software.

Microsoft is considering supporting LAN emulation and ATM signaling in its operating systems. Whether this is feasible will depend on how well-defined the LAN emulation spec is (and therefore how interoperable different vendors implementations will be).

Until the LAN emulation specification is finalized and vendors can demonstrate interoperable implementations, ATM users will need to be sure that the emulation software they purchase is consistent across their adapters and switches.

THE FAT PIPE: CLASSICAL IP

The Internet Engineering Task Force (IETF) has tackled the emulation issue at a higher level than the ATM Forum, opting to encapsulate network-layer protocols for transmission over ATM networks. Two Requests for Comment (RFCs) have been published that deal with this issue.

RFC 1483, known as "Multiprotocol Encapsulation over ATM," defines two encapsulation methods for carrying network-layer protocol traffic over ATM Adaptation Layer 5 (AAL 5). The first method allows multiple protocols to be multiplexed over a single ATM virtual circuit, while the second method assumes that each protocol ▶

LAN emulation hides the ATM NETWORK so driver specs and higher layer protocols won't have to change.

Quality of service: ATM's elusive shine

Two of ATM's most significant features are support for bandwidth on demand and quality of service. In ATM, a sending station establishes a path through the network to a remote resource using signaling. During the process the station establishes a traffic contract, which indicates the various traffic and quality of service parameters the sender wants.

The traffic parameters relate to bandwidth, including peak cell rate, sustainable cell rate and maximum burst size. Quality of service parameters relate to the speed, accuracy and dependability with which cells are delivered. These parameters are necessary to accommodate different types of information. In a video application, for example, cells that are delayed long may have no value to the end station and so should be discarded, whereas a data application may be able to tolerate delay but not cell loss.

It may be some time before applications that have bandwidth and quality of service requirements can be easily supported because the ATM Forum has not yet defined what parameters are needed for different types of traffic, nor the values that should be associated with them. Rather, in the UNI 3.0 specification, the ATM Forum defined broad service classes.

These reflect the performance parameters needed to support the ATM Service Classes defined by the International Telecommunication Union: Class A, a circuit emulation, constant bit-rate video service; Class B, a variable bit-rate audio and video service; Class C, a connection-oriented data transfer service; Class D, a connectionless data transfer service; Class X, a connection-oriented service where the network manager specifies traffic and quality of service parameters; and Service Class Y, a "best-effort" service in which only peak and sustained cell rates need to be defined.

The ATM Forum then mapped these specifications to quality of service classes in an effort to make them easier to implement. These quality of service classes are:

- Class 1 — meets Service Class A performance requirements and should yield performance comparable to current privatlines.
- Class 2 — will meet Service Class B performance requirements and is intended for packetized video and audio in teleconferencing and multimedia applications.
- Class 3 — meets Service Class C requirements and is intended for interoperation of connection-oriented protocols, such as frame relay.
- Class 4 — meets Class D performance requirements and is intended for interoperation of LAN transport protocols, such as TCP/IP and SPX/IPX, as well as metropolitan area network protocols such as Switched Multimegabit Data Services.
- And unspecified quality of service, intended for applications that only require best-effort service.

As vendors begin implementing these quality of service classes it became clear that the quality of service definitions were still too broad. As a result, the ATM Forum has decided to specify a set of parameters that would be needed to support each type of ATM traffic.

Ideally, at connection setup, an ATM end station should be able to indicate each traffic and quality of service parameter it wants and what the values for those parameters should be. Since this work has been under way for only a few months, it's unclear when it might be completed.

— Mary Petrosky

Because emulation HIDES THE NET, applications cannot use advanced ATM features.

is carried over a separate ATM virtual circuit.

RFC1577, "Classical IP and ARP over ATM," builds on RFC 1483. It allows an IP address to be translated to an ATM end-station address. This IP address is used to define the IP subnetwork that the ATM end station belongs to. This addressing information is important to allow IP traffic to traverse LANs and ATM networks.

Several vendors already support one or more of these RFCs or have committed to supporting them shortly. For example, IBM currently supports RFC 1577 on its 100M bit/sec ATM adapter; start-up Efficient Networks has announced RFC 1577 support for its 155M bit/sec S-Bus adapter; and Fore Systems expects to have RFC 1577 and 1483 support for select adapters this fall.

The "Classical IP" approach, as it has come to be called, varies from LAN emulation. With Classical IP, IP traffic is encapsulated and then chopped into ATM cells for transport over ATM. With LAN emulation, an IP frame gets put into an Ethernet frame just as it would if it was going onto an Ethernet network, and then the Ethernet frame is converted into cells.

ATM users have the option of doing IP encapsulation and/or LAN emulation on individual IP subnetworks. Because companies have such mixed environments, some vendors believe that ATM desktops will need to support LAN emulation, Classical IP, and native ATM operation. This will require a considerable amount of software at the desktop.

Long term, for TCP/IP to work over ATM, it will have to be modified so that it has some notion of quality of service and can be used to reserve network resources.

Members of the IETF's Integrated Service Working Group are currently defining services — such as real-time and best-effort — the network transport layer can support. This is necessary to accommodate different kinds of information. For example, voice is sensitive to delay, whereas data may be sensitive to loss. As a result, these service definitions describe the characteristics necessary to transport different types of information.

This working group has had its new IP code running in test beds since the summer, and the draft specification for this new IP is expected in mid-1995. Members of the Internet community have informal contact with the ATM Forum to ensure that compatibility between the IP services model and the ATM services model isn't precluded. However, there is no formal effort to dovetail the two group's work.

"Any type of divergence is going to be problematic," says Bruce Van Nice, manager of new technology at SynOptics Communications. "There is the potential for interoperability problems. Ultimately, the market is going to decide what is acceptable in terms of interoperability or lack of interoperability."

THE "PURE" APPROACH

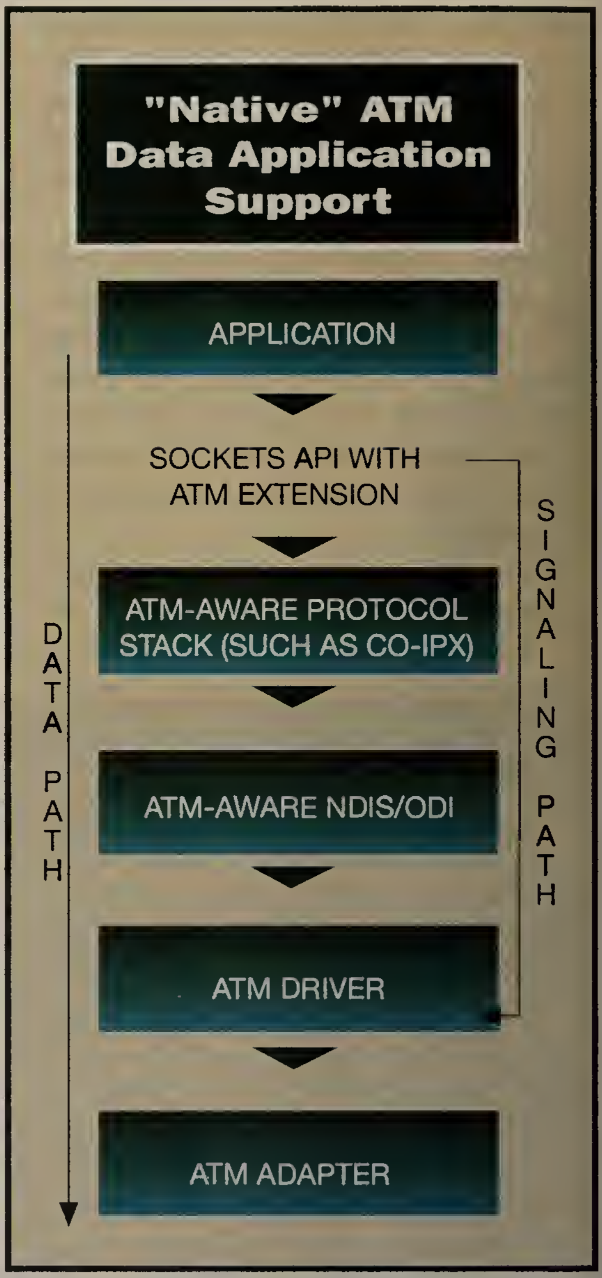
Although LAN emulation provides a way to accommodate existing applications since it hides the network, the applications cannot use ATM's bandwidth reservation and quality of service features.

LAN emulation does give an organization the ability to exploit ATM as a high-speed switching infrastructure — for example, to increase network performance at the workgroup. However, it does no good to have a network capable of supporting bandwidth on demand and quality of service features if the applications can't exploit those features.

Before data applications will be able to run "natively" on ATM, changes need to be made in driver interfaces, transport-layer protocols and desktop operating systems. It will be close to two years before these changes are in place.

Novell and Microsoft have committed to making the necessary extensions to their driver interface specifications, ODI and NDIS. These changes aren't significant and should be easily accomplished.

Transport-layer protocols, such as those in the TCP/IP and SPX/IPX suites, must be modified to operate ▶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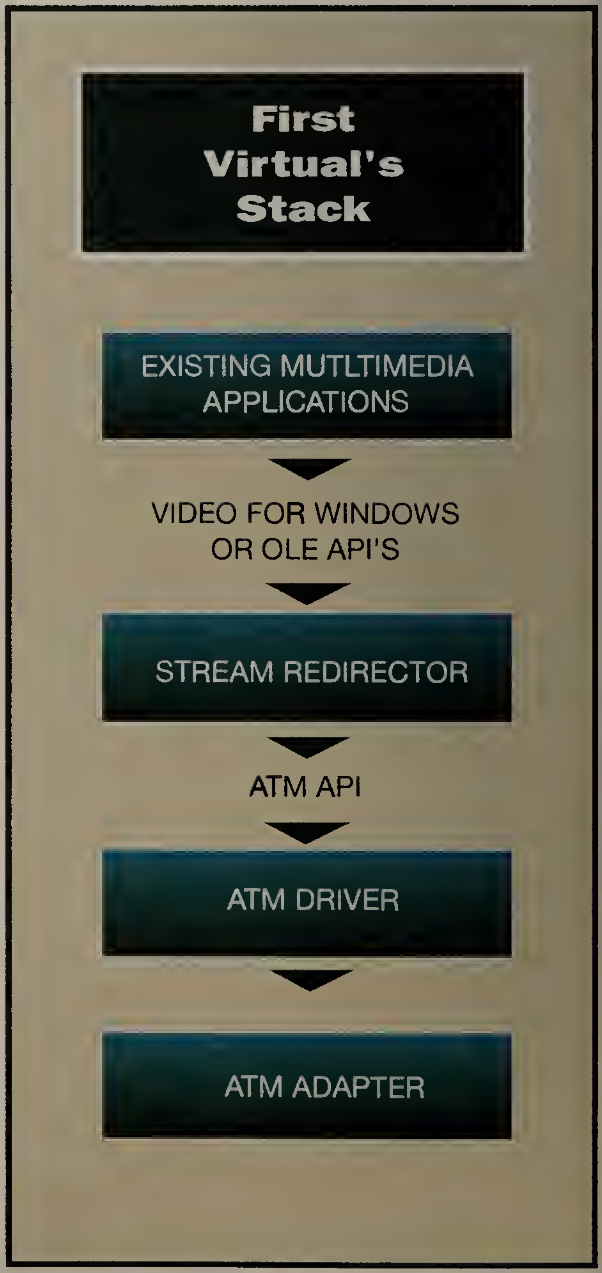

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in a connection-oriented environment. Although ATM is a reliable transmission mechanism, it has no error correction facilities. Consequently, transport protocols will be needed to handle the retransmission of data when a cell is lost or corrupted.

Of the changes that need to be made to accommodate ATM, these protocol changes could be the longest in coming. As noted, the IETF is working on a services-oriented version of IP that will give applications access to quality of service features, but it is unclear when these will match the quality of service features ATM will support.

Novell is currently studying ways to modify the IPX protocol suite so it can work in a connection-oriented environment. Since Novell needs to support existing applications as well as new ATM-oriented applications, it must modify IPX to be able to support both. The connection-oriented IPX — what Novell calls CO-IPX — must be able to translate IPX addresses to ATM addresses, map ATM virtual circuits to IPX sockets, and provide data traffic control and quality of service negotiations.

Novell is also designing CO-IPX to be able to maintain "control circuits" between various networks. Novell envisions a logical IPX internetwork that treats the ATM network as a collection of IPX networks.

The control circuits would be virtual circuits used to interconnect the logical networks and create a domain. These logical internetworks would be interconnected by logical network routers based on Novell's NetWare Link Services Protocol (NLSP). Novell officials envision logical network routers performing all the functions required to create an ATM internetwork and to support LANs, such as broadcast and multicast simulation and ATM address resolution.

STANDARD APIs

Standard application programming interfaces (APIs) must also be defined before ATM-aware applications be easily written.

The ATM Forum is in the process of defining what needs to be exposed to an application so it can run natively over ATM. The ATM Forum expects to have defined the semantics of an ATM API by the second quarter of 1995. Once this work is done, vendors will be in a position to define standard APIs — from low-level adapter APIs to high-level operating system APIs.

Microsoft plans to enhance the Windows Sockets (WinSock) interface to allow applications to specify bandwidth and quality of service parameters. The WinSock interface sits above the transport layer and allows applications to make calls to whatever transport-layer protocol is needed, such as TCP, SPX, NetBEUI, and AppleTalk.

According to Jawad Khaki, development manager for ATM in Microsoft's Windows NT group, Microsoft will work with the WinSock Forum to help identify what needs to be in this API for ATM support. In addition, the WinSock Forum has an established liaison with the ATM Forum.

By leveraging work it has ▶

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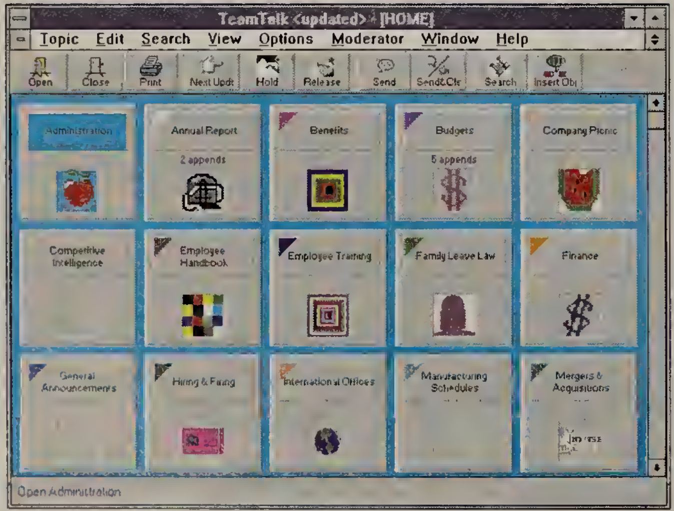

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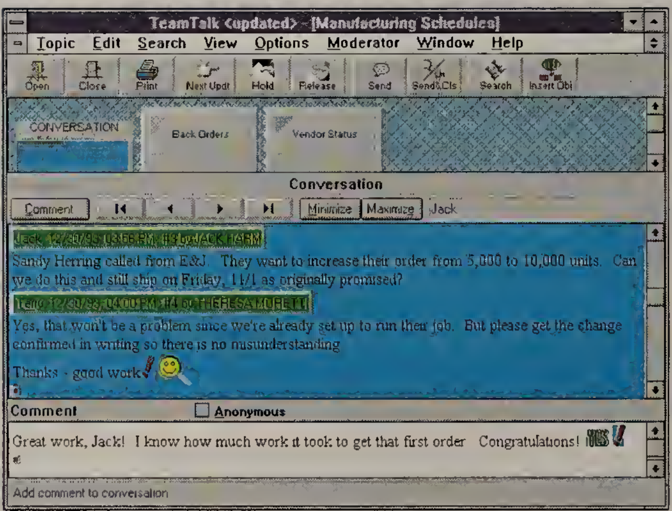
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IS ATM OVERPUMPED?

CONTINUED FROM PAGE 26

already done, including work on a WAN driver interface and a telephony API, company officials believe Microsoft could support applications natively over ATM in 1995. Those applications will need to be written to an ATM adapter API or Classical IP until the necessary changes are made to the transport-layer protocols.

IBM plans to support ATM bandwidth reservation and quality of service features in the next version of OS/2, under development for the PowerPC. IBM is building a network framework into this version of OS/2 that will make it easy to support a range of transport protocols and quality of service features. According to a company official, OS/2 could have quality of service support by mid-1995.

Novell does not have plans to extend the APIs in UnixWare to support ATM. Rather, Novell will let its UnixWare licensees provide this support as a value-added feature.

THE MIDDLEWARE APPROACH

Until transport-layer protocols are modified and operating system APIs are extended to support ATM, ATM users will have several nonstandard ways to make applications ATM-aware.

One way is to use the APIs that vendors of ATM adapters are currently defining in advance of ATM Forum specifications. These APIs will allow applications to make bandwidth and quality of service requests directly to the adapter, but will limit an application to running on machines outfitted with that specific ATM adapter. Fore Systems, for example, supports an API to its adapters that is modeled on a sockets interface. SynOptics Communications is also planning to support an adapter-level API.

Other vendors, including start-up First Virtual Corp., are looking to provide a kind of middleware that allows existing applications to exploit ATM bandwidth reservation and quality of service features.

First Virtual is delivering a combination of hardware and software that allows applications written using Microsoft's Object Linking and Embedding technology or Video for Windows API to run over ATM and exploit its services.

First Virtual has written a kind of redirector software called the Media Operating Systems (MOS) that runs on desktop computers and redirects multimedia objects and video streams away from the local storage across an ATM network to a Media Server, enabling users to insert multimedia objects into spreadsheets, word processing files, and presentations.

The desktop computer needs to be running this Streams Redirector software and have a multimedia-enabled ATM adapter, which First Virtual will supply until third-party adapters are available. In addition, the company will provide a video service that run in conjunction with file and messaging servers. In addition to its redirector technology, First Virtual will also support LAN emulation and Classical IP.

CUTTING THE ATM DIAMOND

It is clear that most early users of ATM will be using LAN emulation or Classical IP to allow their existing applications to run over ATM. These two encapsulation techniques are likely to be used for the foreseeable future, as it will be a long time before a large number of commercial applications are ATM-aware.

In 1995, ATM-aware video and multimedia applications will begin to appear. Initially, these applications will be tied to specific ATM adapters. If the industry can agree to a standard ATM-layer API, then ATM users will be freed to use any compliant adapter. In 1995, ATM support in several operating systems will also begin to emerge.

It will be mid-1996 or later before all the pieces are in place to allow data applications to run natively over ATM. Because these applications are intolerant of data loss or corruption, transport-layer protocols—or some other mechanisms—need to be in place to assure reliable data delivery.

Only when all these pieces are in place, and quality of service parameters are well defined, will ATM be able to deliver on its promise of brilliance.

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OLE: The next SNA?

CONTINUED FROM PAGE 20

support for COM on MVS is likely to require a great deal (perhaps an infinite amount) of patience. And even if third parties provide COM support for MVS, as they probably will, is it reasonable to base an organization's mission-critical applications on such a foundation?

If COM is to achieve ubiquity, this hole must be filled. Still, COM's reliance on DCE for distribution makes COM-on-MVS significantly more likely, since IBM is promising good DCE support in the MVS environment.

THE COMPETITION

In the burgeoning world of distributed objects, COM is by no means the only choice. The most visible competitor is the Object Management Group's Common Object Request Broker Architecture (CORBA).

CORBA is in some ways like COM. The goal is to provide reusable and potentially distributed software components, it includes an interface definition language, and so on.

It's also different in some important ways. Chief among these is that CORBA does not define an actual wire protocol for communication between distributed objects, nor does it define a complete set of programming interfaces for applications to use.

Given that the usual goals of multivendor standards are interoperability and portability, these omissions are striking. The next major version of CORBA will include a specification for interoperability, but it's likely that this specification will only define gateways between different vendor implementations.

Getting all of the major CORBA implementors to adopt the same base protocol appears to be impossible, at least in the near term. According to 3M's Estrem, "Without effective interoperability, CORBA isn't useful to us."

If OLE, or more correctly, the distributed incarnation of COM, has the potential to be the SNA of the client/server world, CORBA looks more and more like client/server's OSI.

Like OSI, CORBA is produced in consensus-oriented committees, with all of the techno-political compromises that implies. Also, there is no common code base for CORBA products, something that has been a sine qua non for the success of previous open technologies.

Each vendor instead writes their own CORBA implementation, which has led to wide divergence among available products. In fact, given COM's use of the DCE standard, one could argue that COM is actually more "open" than CORBA since implementations on all platforms can communicate in a standard, vendor-neutral way.

CONCLUSIONS

SNA probably wasn't the best technical solution for the problems it solved. But it was widely adopted because it solved problems in an effective way and because it was an intrinsic part of the then-dominant vendor's solution.

In the same way, COM may not prove to be the best possible technical solution to the problems it addresses. But Microsoft's hold on desktop systems makes COM inevitable in the Windows environment.

More and more, desktop applications are driving the enterprise. As the desktop environment moves to COM those applications will follow suit. And as COM becomes distributed in a standard way, the structure of desktop applications may well move naturally into the enterprise.

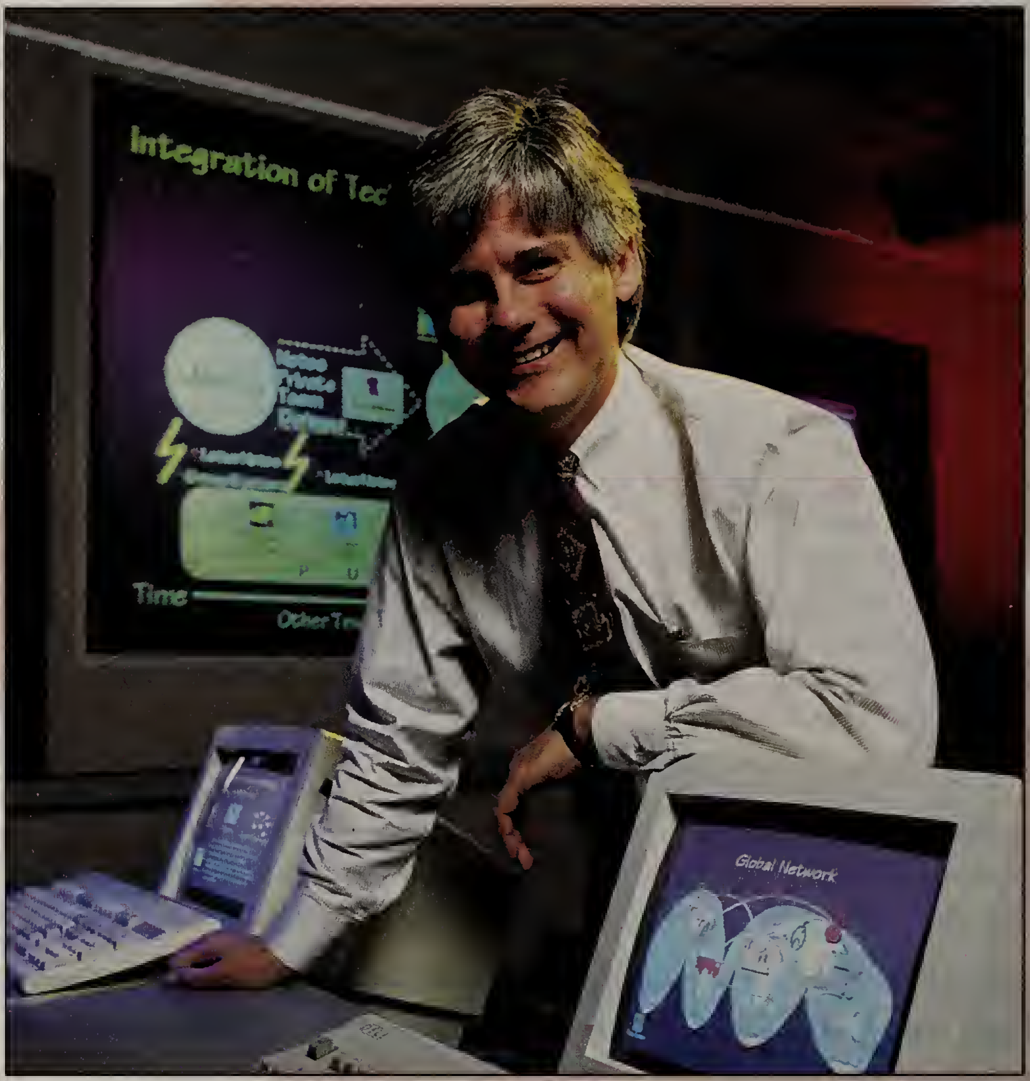
As SNA once did, COM could represent the safe choice for user organizations, the one that's guaranteed to work in their environment, and the one that fits best with what they already have. After all, no one gets fired for buying Microsoft.

Chappell is principal of Chappell & Associates, a training and consulting firm focused on multivendor distributed computing. He can be reached in Minneapolis at 612-922-5784.

TEAMS STAR

BY JOHN DIX

EVEN FOR LEADING EDGE COMPANIES IT IS A STRUGGLE TO INTEGRATE THE PLETHORA OF TOOLS NEEDED TO SUPPORT GROUPS



Chris Salvo

Brad Jackson, Texaco: "All these tools needs to be integrated."

Texaco, Inc. has long been a believer in the idea that technology can help improve team performance. Even before the company embraced the team concept as part of a quality initiative in 1989, Texaco was experimenting with group decision support systems.

And all those years of experience has made one thing clear: integration is the key to success. Since no single collaboration product does it all, Texaco has had to brave the task of trying to weave different tools together and integrate the resultant "system" with its business processes.

Given the nascent state of team tools today, that is no mean feat. The technologies are at different stages of development and there is little common ground. Incompatibilities can be as fundamental as one product being based on Windows and another on DOS, says Brad Jackson, assistant to the general manager of Texaco's Information Technology Department (ITD).

While that particular problem will go away with time, more enduring will be the integration challenges involved with things like extending collaboration tools across the wide area so remote workers can participate in meetings.

Hurdles aside, years of effort at Texaco have resulted in a

AT TEXACO

state-of-the-art collaboration infrastructure that, although still partly devoted to research, would be the envy of any technologically advanced company.

The crown jewel is a meeting room in Houston outfitted with videoconferencing facilities, computer-based brainstorming aids and access to shared databases, among other tools.

✪ ✪ ✪ ✪

"EVERYONE SAYS 'I WANT TO DO VIDEOCONFERENCING'... BUT IN MANY CASES PEOPLE SIMPLY WANT TO BE ABLE TO SHARE INFORMATION."

BRAD JACKSON, TEXACO

A LONG HISTORY

Texaco began dabbling with products such as Lotus Development Corp.'s Notes as early as 1985. But it wasn't until it launched a big quality push later in the decade and adopted a team-based structure that it started to seriously pursue technology designed to get the most out of groups.

The move to teams, in fact, followed on the heels of a reorganization of ITD in which application development was moved out of the centralized ITD group to individual business units.

At the highest level Texaco is organized into regional operations, including, for example, Texaco USA, Texaco Middle East Far East and Texaco Latin America/West Africa. Those operations are composed of units such as refining and marketing, each of which now has its own IT group.

The senior IT person in each group reports to the head of their business unit but also has dotted-line reporting responsibility to the head of ITD.

"Our responsibility in ITD is for worldwide communications and computer processing," Jackson says. ITD runs Texaco's large data centers, is in charge of telecom and retains control of core applications such as human resources management systems.

While distributing responsibilities for other applications helped align IT with the company's various business efforts, Texaco recognized the need to leverage synergies across the organization. To that end, it formed a group called the Information Planning Group (IPG), which is composed of members from ITD and each of the business groups, and charged it with fostering development of a common IT infrastructure.

"IPG is responsible for coordinating the IT function across the entire Texaco enterprise," says Jackson, who is the coordinator of the group. "The idea is to have the collective group, through a consensus process, develop the standards that will be applied to the enterprise."

These standards cover everything from application programming interfaces such as MAPI to application suites like Microsoft Office and the very collaboration products IPG uses to get its job done.

While the tools designed to facilitate team effort have been adopted to varying degrees across the company, IPG is perhaps the best example of how Texaco is integrating the products with business processes to increase group productivity.

STARTS WITH SAMM

One of ITD's earliest experiments ▶

Brainstorming through computers

There are many techniques to use when brainstorming, but one Texaco has found helpful in larger groups is to start off by having people use Ventana Corp.'s Group Systems to jot down their own ideas in private.

"Then we go around the room and we say, `Okay, find an idea on your list that you like, send it to the screen for everyone to see and tell us a little bit about it," says Brad Jackson, assistant to the general manager of Information Technology Development at Texaco.

"At this phase we're not discussing or debating. There might be questions for clarification, but we're really just trying to get the idea," Jackson says.

Then Group Systems is used to help prioritize the ideas, selecting out the best of the best for further study.

Having people start by creating their own lists ensures everyone participates and also means only the best ideas are posted.

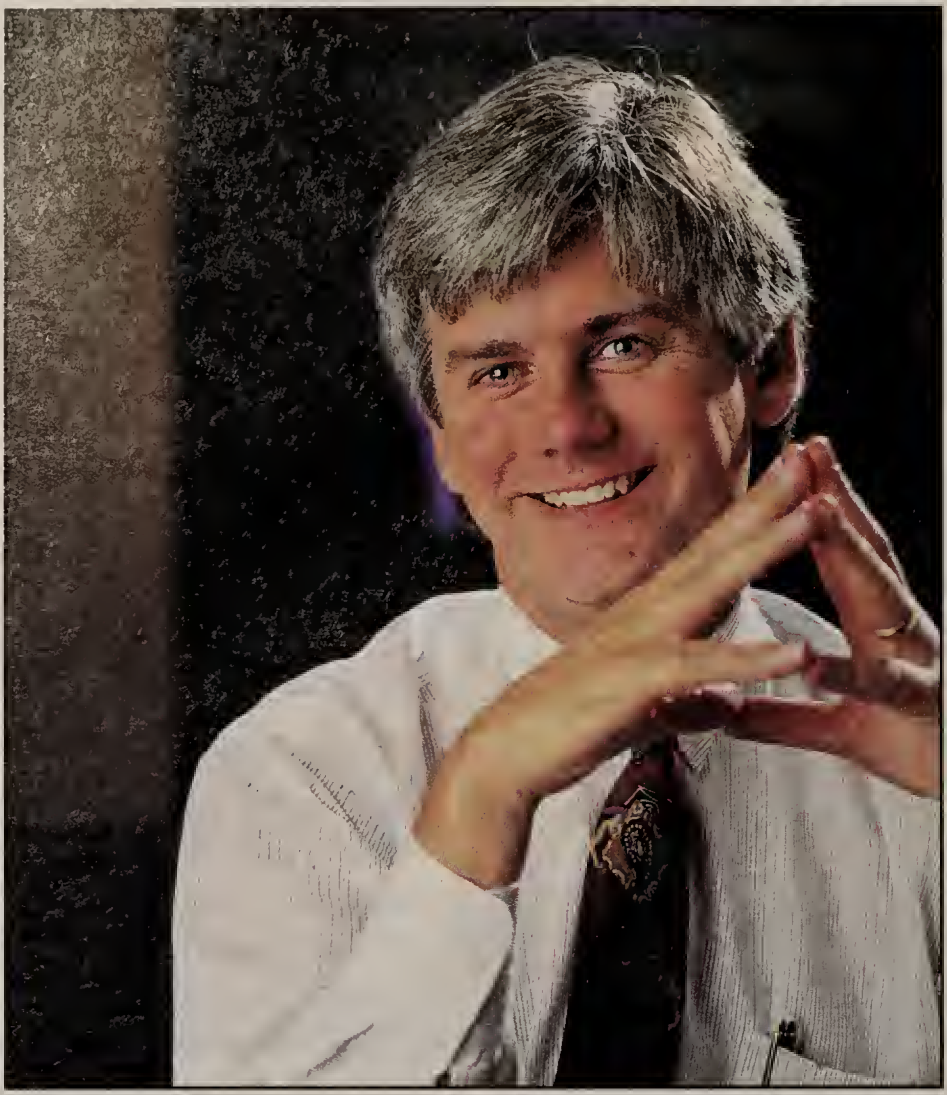
The alternative, where ideas are simply thrown onto the table as they occur, means eight vocal people in a meeting of 15 could end up generating 80 ideas. "Then you spend all your time asking `Well, is that idea the same as this one? " Jackson says.

"We put that responsibility on the participants. We say, 'Look at your list and then look at what's up here and you decide if you have something that is important and different."'

The same 15 people might generate 150 ideas, providing a broader initial knowledge base, and then only the best ideas will float to the surface.

with group tools was with a software package called SAMM — Software Aided Meeting Management — developed at the University of Minnesota.

SAMM ran on a Unix-based NCR minicomputer and was designed to help people get the most out of face-to face meetings. Team members could brainstorm by using terminals to tap into a shared database and post ideas and then prioritize them. This proved to be particularly helpful in the early stages of the quality process when it was necessary to set goals and lay down plans, Jackson says.



"MANY PEOPLE TALK ABOUT NOTES OR ANOTHER SINGLE TOOL PROVIDING THE ANSWER. I TALK ABOUT INTEGRATING THE TECHNOLOGY AND INTEGRATING IT INTO BUSINESS PROCESSES."

* * *

"We took a little storage room and put in a table and terminals and got ten teams to volunteer to participate," Jackson says. "They held their team meetings in there every week and filled out questionnaires and we videotaped them over a two-year period to see if the tool made a difference, to see how they did things differently."

Some of the findings were enlightening. SAMM encouraged participation from all team members, not just the usual dynamos. And many teams said meetings became more fruitful because use of the tool forced them to do more upfront planning, something people could get by without in regular meetings.

Finally, the study revealed that teams with strong leaders committed to the quality process fared better using the tool than others, showing that technology alone wasn't the answer.

While SAMM was a good research tool, by 1991 team management had become a core element of the quality push at Texaco. So when a building renovation project presented the opportunity, ITD designed a new collaboration command center and brought in a commercial-grade SAMM replacement — Group Systems from Ventana Corp.

The new room is bigger — 1,200 square feet vs. the 300 square-foot storage room — more elegant and there are networked PCs at each of the 17 seats around the horseshoe-shaped table instead of terminals. The use of PCs represented a significant change: instead of being hardwired to one resource, the micros enable ITD to support a number of tools, including Ventana's Group Systems, Lotus Notes and E-mail.

The room is also outfitted with a audioconferencing system and a multi-camera, multiview videoconferencing system that has a large screen at the mouth of the horseshoe table.

ROOM IN USE

Although IPG members manage to do most of their work with tools available from their respective desktops, occasionally they flock to the command center to tackle big issues in face-to-face meetings.

"The team might come together to try to decide 'What is the strategic intent of IT at Texaco,' and use a tool like Group Systems to brainstorm and prioritize ideas," Jackson says (see sidebar). "They could then take the output of Group Systems and export it to shared Notes databases."

The Notes databases let groups influenced by IPG decisions see what direction it is heading. "People that may have to implement some of these standards or strategies, or have an opinion about what's being formulated, can follow along in the IPG team activities database," Jackson says. "I call that an unmeeting. You're invited to participate but you don't have to show up."

IPG members also use the databases to post progress reports on tasks they tackle individually, helping keep the team intact in a virtual sense until the next face-to-face meeting.

"So we use Group Systems where it fits into the process. We use Notes and other tools where they fit in," Jackson says. "But all these technologies have to be integrated.

"Many people talk about Notes or another single tool providing the answer," Jackson says. "I talk about integrating the technology and integrating it into the process so one team can interact with multiple teams.

Integration is easier said than done. Besides the fact that many tools require different operating system environments, few vendors have taken into account how to integrate their products with others, or how to provide hooks into their own offerings. Worse yet, the products are still young and evolving so upgrades can lay waste to any integration effort.

REMOTE CHALLENGE

But perhaps the single biggest challenge is trying to support remote users.

While it is easy enough to use videoconferencing to let remote IPG members peer into meetings, linking the different conference media and enabling remote users to participate in the same way as local attendees is a different story.

"We certainly have not done this well," Jackson says.

"Obviously you can show remote users a list of items to prioritize by putting up a slide, but what you can't do is change the slide or create a new graph or generate new ideas because you have to turn it into paper before you can modify it," Jackson says.

"What we're looking at is, if someone creates something in one place, how can that be shared and worked on simultaneously by workers in other places?," he says. "This is a real tough area, and certainly not something we've overcome. We've used a variety of tools to address this, partly to learn and partly to solve particular problems."

Texaco has used Notes, for example, to complement teleconferences by letting people dial into a centralized Notes database.

"This was a way to help augment a conference that would otherwise be difficult to conduct using only audio because of what I call the Ethernet problem," Jackson says. "If someone asks 'Are there any questions,' everyone will listen and when they don't hear anything will all start talking at once and crash and then have to sit back and wait."

While there are still problems to overcome, marrying teleconferencing systems with information sharing tools can rival the func- ▶

tionality of videoconferencing.

"Everyone says `I want to do videoconferencing. I want to see the person,"' Jackson says. "But in many cases people simply want to be able to share information, to participate by generating ideas."

Besides integrating different types of media, the challenge of supporting remote users involves trying to synchronize resources. Not only do remote users typically have different systems, it is hard to ensure they all have the latest versions of the tools being used back in command central.

LONG-TERM STUDY

The fact that integration is such a daunting challenge does not surprise Texaco because it views its new command center and all the associated tools as much as an ongoing research project as a way to help teams make critical business decisions.

In fact, Texaco and the University of Minnesota received a grant in 1992 from the National Science Foundation to study teams and technology. "We're studying 80 Texaco business teams, each of which have an average of six to ten members," Jackson says. The company recently finished the third and last round of data collection for the study and is in the process of analyzing the results.

"The major things we're looking at are how teams function and what mechanisms they use to coordinate with one another," Jackson says. "Some teams may be leading edge, using tools like Group Systems or Notes or E-mail or whatever. Others may be relying more on paper and the U.S. mail."

Some of the early findings show that:

- People tend to be on three to four teams.
- Teams are geographically dispersed — more than 40% have members in different facilities, more than 30% have members in different cities and nearly 30% have members in different time zones. "Obviously the time and space barriers are real," Jackson says.
- And some teams stay constant over time, while others are more dynamic, having members that come and go.

"That's a group memory problem," Jackson says." Knowledge leaving and new people coming in."

Although the study is sure to provide a wealth of new insight, the question remains, what has years of research and experience taught ITD about the state of collaborative computing?

"We're very, very early on," Jackson says.

"My vision is that all of this will come together in the future around objects," he says. "You'll have a desktop or a laptop that is enabled. And if you're going to be engaged in a remote meeting you'll have a camera object representing the video link you can open up, and others that will enable you to participate in brainstorming sessions and tap into remote databases. I see all of this merging and the benefit is you won't have to learn how to use a lot of different tools."

Dix is editor of COLLABORATION.

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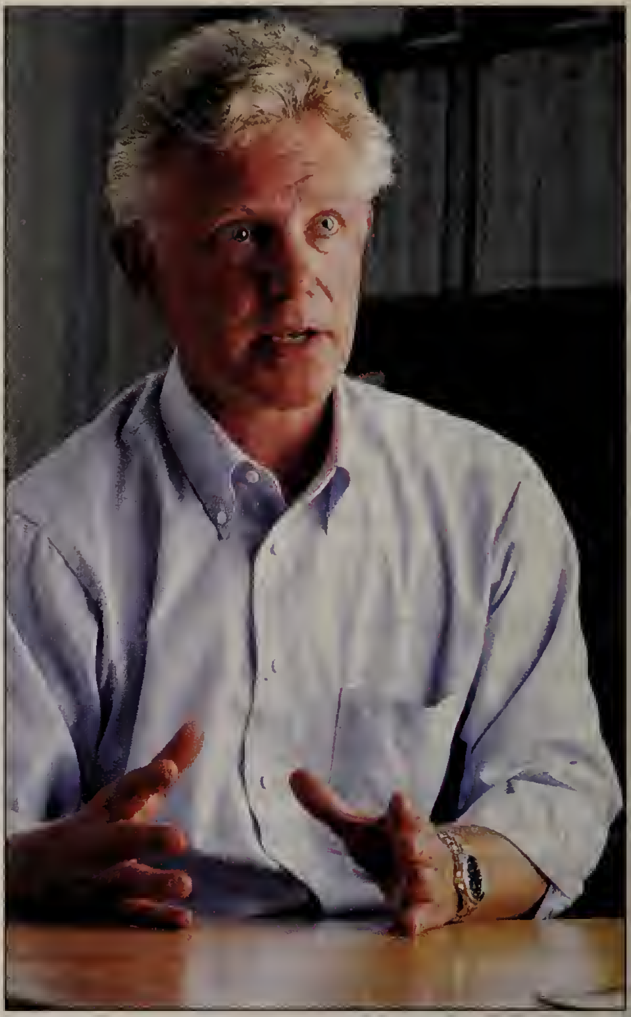
NETWORKS *of* PEOPLE

BY JOHN DIX



"You've been going at it all wrong. Trash what you have. Start all over again. Reinvent the company."

With advice like that, no wonder executives welcome change like a blind date.

Jessica Lipnack and Jeffrey Stamps, the husband and wife team of The Networking Institute, Inc., a consultancy in West Newton, Mass., advocate more of an evolutionary approach to change that builds on the good to be found in current corporate organizational structures.

Their newest book, *The Age of the Network: Organizing Principals for the 21st Century*, will be published in November by Oliver Wight.

COLLABORATION Nine times out of ten you refer to networking in an organizational sense whereas we think of it in terms of technology. Can you give me your definition.

LIPNACK In a sort of a global cultural perspective, we lead off this book by saying each age of civilization has its signature form of organization. First it was hunters in small groups. Then when agriculture came along hierarchies rose up. Then industrialism came along and we got bureaucracy. And now we are in the age of information, the age of the network.

We think that the network is a form of organization and the successor to bureaucracy and hierarchy. And that as we move into the 21st century, we're only going to see more and more attempts for organizations to form themselves into networks.

These organizational networks can be bound within a corporation or school, or they can cross organizations — say IBM, Motorola and Apple getting together to develop the PowerPC chip or all of the public schools in Maine coming together to think about the future of Maine's education.

STAMPS The premise is very simple, you see. If you use network technology then you adopt this idea of a networked organization and you get much more synchronicity.

For example, if you look first at the purposes of the organization, how it segments itself to best provide services to customers — which is usually going to be in some decentralized mode with centralized sharing — then that begins to tell you something about how to structure your technology network to support the people network.

Many network vendors have tried — Lotus did this for years with Notes — to deny that you have to change your organization to make use of their product. But it doesn't work that way.

COLLABORATION Are you saying you don't start with an organization or technology game plan in mind, you have a business plan and the organization and technology plan comes out of that?

LIPNACK Exactly. The key is to take whatever the mission of the organization is and devolve it down to the level where people throughout the organization can understand what's going on. Because if everybody understands what the busi-

As organization theories go, networking is not as

"Just add links among your existing bureaucratic processes."

ness is up to, then it's obvious what kind of organization you need. The organization falls out of the purpose, as does the need for technology.

DON'T REINVENT THE CORPORATION, REORGANIZE IT AROUND EXISTING STRENGTHS

COLLABORATION While many advisers are calling for tearing down organizations and starting over again from scratch, you recommend building on what you have, retaining what you can from the hierarchy and bureaucracy while moving forward.

LIPNACK Yes. And there are probably some management theorists who are going to throw some pies at us for this.

STAMPS There's an example in a sidebar on Jack Welch in one of your earlier issues of Collaboration. Jack Welch [of GE] is well known for saying smash the boundaries, create the boundaryless corporation. Our message is a little different: cross the boundaries. Boundaries are critical. Respect boundaries, but learn to cross them. Make them more porous and allow flexible interaction across them. But don't smash them because what you'll end up with is jello.

LIPNACK One of the points we make in our book is this: Organizational advantage is the most critical thing you can have for the 21st century. It used to be if you had the right technology, the right people and the right access to capital you were secure. But look at the list of companies that have had all those things that are now busily filing for Chapter 11.

COLLABORATION What is it you want to retain from hierarchical and bureaucratic organizational models? What is the baby and what is the bathwater?

STAMPS People often talk about hierarchy bureaucracy as a single form of organization, whereas historically bureaucracy is really a later development that emerged in the industrial era.

Structurally, the baby in the bathwater of hierarchy is levels. Big organizations are made up of little organizations and small groups permeate everything. There are small groups in the executive suite, small groups on the shop floor, small groups of programmers.

But today you have one-way control and information flow. That's the part you want to lose. The part you want to retain is the multilevel structure because that's the only way you can really keep any vertical integrity, even as you're exploding horizontally.

COLLABORATION But can you keep a multilevel hierarchy and still achieve the radical change that some struggling companies need to survive?

LIPNACK Well, it's sort of a given that you probably need to reduce the number of levels. Everybody agrees on that, even the people sitting at the top of those hierarchies. But it doesn't mean you shouldn't have groups within groups within groups, each having its own characteristics and independent sphere of activity.

STAMPS That is the baby in hierarchy. Somehow you have to get level structure into your network design. Now, the thing that bureaucracy brought along was specialization. That's the thing that you absolutely do not want to lose.

All those boxes on bureaucratic org charts are fine. The problem is the mutually exclusive one-way linkages you find in a hierarchical form. If you take the same bureaucratic boxes and start connecting them in different directions — and most of the new links will be horizontal — then you've got a very, very different thing.

Then the bureaucratic box becomes another node on the organization network. But nodes will be specialized. That's part of the power of the network idea — that it is both independent and interdependent, both decentralized and centralized, as opposed to the old way which was only centralized.

The easiest way to move from hierarchy bureaucracy to team networks is to just add links. Just add links among your existing bureaucratic processes.

COLLABORATION What will the future look like when we move to network organizations based in part on what we've learned from hierarchies and bureaucracies? ▶

sexy as some but more likely to be what you need.

STAMPS You will still find hierarchies, but they will be a lot slimmer. You'll have hierarchies because businesses will continue to have owners who have coercive power. You're going to have senior executives who are the officers of that power, but it will be a reduced amount. A reduced amount of the total activity will be devoted to that hierarchy. They won't be the only channels of communication.

You will continue to have bureaucracy, but you don't want constitutions, laws, and regulations all to simply disappear.

And then you're going to have a lot of networks. You're going to have team networks. You're going to have intra-organizational networks. You're going to have intercompany networks. You're going to have networks at all levels and stripes, informal and formal.

COLLABORATION Are your ideas meant to help companies reorganize internally or establish links with external partners that could help them solve problems?

STAMPS Both. And you really have to see this as both. Probably the companies that are most successful getting cross-boundary collaboration going internally are going to be most successful at it externally.

COLLABORATION How does adopting a networked organizational style help companies internally?

STAMPS A good example is Eastman Chemical, which was one of the Baldridge Award winners and which we talk a lot about in the new book. What the Baldridge examiner said was Eastman Chemical seemed to be a seamless company.

They once had a lot of impediments to teamwork in their culture, as most companies do, but they transformed themselves. Now instead of having to go up the chain of command when all you really want to do is talk to the technical person in the next cubicle, you are expected to communicate horizontally in the course of doing your work. The chain of command is one of the things that gets eliminated in the networked organization.

COLLABORATION OK. How does networking across organizations help?

LIPNACK There are a many dramatic examples of where this has been tried, such as in Northern Italy. In the early '70s the region had 20% percent unemployment. It was one of the poorest regions in all of Italy. Then these small companies started working together and creating networks among themselves, and within ten years they had effectively reduced unemployment to zero. And it turned this very poor region of Italy into one of the wealthiest.

When you get large numbers of companies networking, you get large-scale effects very quickly. And this is something new in economic development. If you look at places in the U.S. that are trying it, which is now virtually every state, what you see is small companies being able to move ahead very quickly, increase business, and do hiring where other companies are laying off. And even large companies are doing it. They're being driven toward it because the costs of R&D, in particular, are out of reach for just about everybody.

A group of CEOs in Silicon Valley have come together to do exactly what we're talking about. It's called Smart Valley. The guy who was CEO of Network General started it. And we're hoping to launch a similar effort here in Massachusetts to try to bring companies together, get organizations working together.

COLLABORATION In these network organization models, what kind of management roles are retained? Who calls the shots?

LIPNACK Fewer bosses, more leaders. This is one of our prime principles. Everybody's got a leadership role to play at some point in the process and it shifts. The ability to shift leadership, that fluid style, is probably the thing that's going to get companies the farthest as time goes on. The executive committee has become much more important than the traditional CEO. Problems are just way too complicated for individuals to solve.

COLLABORATION How about future trends. What do you see unfolding?

LIPNACK I think people are going to rebel against the constant drive for high performance. People are going to rebel because no one can be expected to operate at that level forever and we have to become much more respectful of people needing downtime and needing rest.

Another big thing is we think that team implementations are going to continue to fail at alarming rates. There's an expression at the Postal Service called HAM FAT. Have a Meeting, Form a Team. As if that will automatically fix the problem. It won't.

In many cases we have all of these teams running around but there's no overall architecture to the organization, no understanding about how all of these things fit together.

STAMPS And the notion of social capital is important. This is the idea that there is economic value in having dense, purposeful social and business relations. Even in cross-organization network alliances that fail, if they were done with integrity and trust it will make it easier the next time. If I stab you in the back first, then I'm going to come out the winner. But the news about my behavior will be carried on.

Everything in business is transactions. So, where trust is high your transaction costs are going to be relatively low. Where trust is low, your transaction costs are going to be very high because you're going to surround them with legalities and there's going to be a lot more baggage associated with it.

LIPNACK Which leads us to say that cross-organization networking falls to the bottom line directly. The more trust, the lower the cost of business, the higher the profitability.

STAMPS And the more likelihood that you're going to have access to future opportunities. In a time when opportunities are just exploding all over the place and just following old lines of business is not very successful, that means virtually everyone has to have one if not both eyes open for future opportunities.

DIX IS EDITOR OF COLLABORATION.

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Utter the words, "schedule a meeting" and you set off a chain reaction that invariably frustrates people, wastes time and consumes money.

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Circle Reader Service ***#33***

CLIENT/SERVER APPLICATIONS

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INTERNET ACCESS

Client software brings OLE-based WWW connectivity

BY ADAM GAFFIN

Wilmington, Mass.

BookLink Technologies, Inc. last week said that it will soon release a World-Wide Web (WWW) browser for Windows that features support for Microsoft Corp.'s Object Linking and Embedding (OLE) 2.0 technology.

With OLE 2.0 support, users of the company's InternetWorks browser will be able to quickly cut and paste between Internet-based WWW documents and those on their desktops. Any WWW document hyperlinks, which let users connect to resources via a mouse click, would remain live.

> **"Corporate America is beginning to embrace Internet-developed technology. [The products are] available, they work, and they run on major platforms."**

WWW servers provide repositories for documents, files and links to other resources across TCP/IP nets.

Long term, OLE 2.0 support means corporate developers will be able to integrate the client with various back-end applications.

David Wetherell, BookLink's chief executive officer, said a number of firms are beginning to look to WWW servers as a way to distribute corporate information internally as well as to the outside world. "Corporate America is beginning to embrace Internet-developed technology," said Daniel Dern, an analyst in Newton, Mass. "[The products are] available, they work, and they run on major platforms."

Vendors are reacting in large numbers to user interest in WWW servers. IBM, Microsoft and Novell, Inc. are all adding support for WWW connectivity to client and server operating system software. Novell ships software to connect NetWare clients to WWW servers, while IBM's newest version of OS/2 features an integrated WWW client.

Start-up companies are trying to counter the big players by giving versions of their client software away and by developing specialized WWW servers.

Mosaic Communications Corp., for example, recently began distributing copies of its client for free over the Internet, hoping to build support for its impending server software.

One feature of BookLink's client software is support for multithreading within WWW windows. This will enable users traversing large WWW documents via low-speed links to call up another WWW document while the first is being accessed, Wetherell said.

InternetWorks also features electronic mail and newsreader software for retrieving and responding to messages distributed via the Simple Mail Transfer Protocol and Network News Protocol, respectively.

The product will begin shipping by December for $99 per client. A free, limited-function version will be available over the Internet by mid-November.

©BookLink: (800) 453-7873.

Dharma launches ODBC-based middleware

BY BARB COLE

Nashua, N.H.

Dharma Systems, Inc. this week will announce middleware that lets Open Database Connectivity (ODBC)-enabled applications do joins across multiple data sources.

The ODBC Integrator software also provides a way for users to move and replicate data between clients and servers.

The software resides on client machines between applications based on Microsoft Corp.'s ODBC database connectivity specification and ODBC drivers for specific databases. It negotiates connectivity between desktop applications and tools to one or more ODBC-compliant back-end data source.

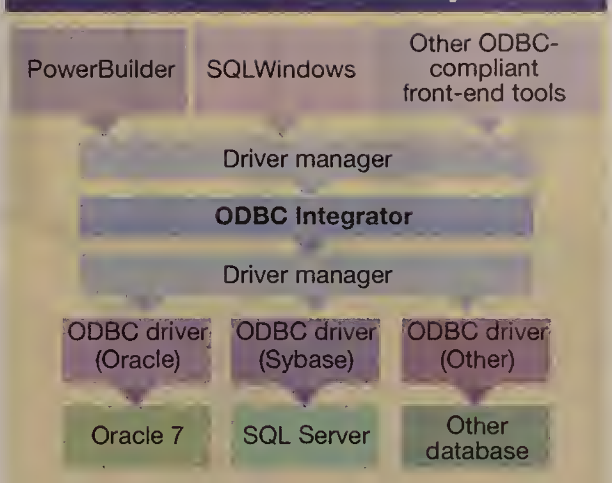
"Right now, everybody is writing custom programs to merge data from several different sources. If we can do joins across different databases [with ODBC Integrator], it should save a lot of programming time," said Aruchunan Vaseekaran, president of Ontash Systems, Inc., a Palisades Park, N.J., consultancy that is building an ODBC-based application for Philip Morris, Inc.

ODBC Integrator can also be used by application developers to move data that is useful to end users off servers and onto client systems. End users can then query the data locally, cutting network traffic.

Conversely, ODBC Integrator can be used to batch load data onto a server after data validation and cleanup is done on the client, the company said.

Such data movement would typically require the use of sophisticated conversion procedures. However, when data is moved via ODBC, data compatibility between ODBC-enabled front ends and supported servers is ensured. The replication capabilities in ODBC Integrator are not as sophisticated as those found in server-based products such as Sybase, Inc. Replication Server, Dharma officials said.

Database traffic cop



Dharma's ODBC Integrator lets ODBC-enabled applications process queries across multiple data sources.

GRAPHIC BY TERRI MITCHELL

For instance, ODBC Integrator only replicates data in one direction. Users download server-based data, update the information locally and replicate the changes back to the server database. Server-based replication products typically replicate data between servers, as well.

With ODBC Integrator, application developers can specify frequent replication that will occur automatically from the client to the server.

Vaseekaran said ODBC Integrator's replication features would be useful for laptop users who need to integrate the data they collect on the road with a master database.

Analysts said ODBC Integrator would be most useful in the mobile computing arena and when used to off-load work from servers to clients in the workgroup or departmental environment.

"It could be a fundamental technology when used remotely with something like Lotus [Development Corp.] Notes," said Wayne Kernochan, an analyst at Aberdeen Group, Inc. in Boston.

ODBC Integrator for Microsoft Windows will cost $400 per user and will be available by the first quarter of next year. The company will also offer site licenses.

The company is readying Unix, Macintosh and Windows NT versions for mid-1995.

©Dharma: (603) 886-1400.

BRIEFS

IBM officially announced last week its anticipated VisualGen Team Suite for **client/server application development** (*NW,* Sept. 26, page 1).

Included in the suite is TeamConnection for OS/2, an object-oriented repository system for managing and storing application components shared during team development. Its companion product, IBM Exchange for OS/2, helps customers protect their existing development investments by enabling them to migrate their data models into TeamConnection. Also included is DataAtlas for OS/2, a new data dictionary for creating and maintaining data definitions, as well as a new release of VisualGen.

The new release of VisualGen is available now with components ranging in price from $1,250 to $13,500. TeamConnection will enter beta testing in December and will be available in the second quarter of 1995. The rest of the VisualGen Team Suite will be generally available in the second quarter of 1995. Pricing is expected to be announced in the first quarter.

IBM: (914) 766-9155.

Intersolv will announce this week a new version of its DataDirect suite of **Open Database Connectivity (ODBC)** drivers, based on the most recent version of the Microsoft Corp.-developed specification. Intersolv said the drivers, based on ODBC 2.0, will be faster than earlier drivers, based on Version 1.0.

Intersolv also said it will license its DataDirect ODBC drivers to Sybase, Inc. and Borland International, Inc. Sybase will license several ODBC drivers for distribution with its SQL Server 10 database.

Intersolv: (301) 230-3200.

Micro Decisionware, Inc. (MDI) has started shipping Release 2.4 of the Windows NT version of its **Database Gateway for Application System/400.** The gateway supports IBM's Distributed Relational Database Architecture and gives Windows NT users read/write access to AS/400-based data. Using the front-end tool of their choice, users can move data between AS/400s and other data sources such as DB2, DB2/2, SQL Server 10 and Oracle7.

Pricing starts at $5,990.

MDI: (303) 443-2706.

Vendors restock data warehouse supplies

BY BARB COLE

Los Gatos, Calif.

Red Brick Systems, Inc. last week announced a new version of its data warehouse server software designed to house large databases, while Software AG of North America, Inc. unveiled a client/server tool for loading and refreshing data in a warehouse.

Typically used to handle decision-support applications, data warehouses are built separately from on-line transaction processing databases so end users can access data without interfering with production database performance. The data stored in the warehouses can be compiled from one or more data sources.

Red Brick Warehouse VPT is a new version of Red Brick's flagship data warehouse offering than can handle up to 500G bytes of information, up from 150G bytes in the previous version, said Ram Srinivasan, the company's director of product marketing.

In addition, the software can now run on parallel processing computers, which means queries can be spread over multiple processors. Administrators may also partition data onto different processors, lettin administrators move data into or out of the warehouse without disrupting other data in the system.

See Warehouse, *page 43*

Interactive EDI specs prescribed for health care firms

BY JODI COHEN

Alexandria, Va.

The U.S. organization in charge of setting X12 electronic data interchange specifications will release its first two standards for interactive EDI — both for the health care industry — in December.

Interactive EDI provides for near real-time response to EDI documents (transaction sets), whereas traditional EDI is based on slower store-and-forward or batch-oriented communications.

The ASC X12 group's new specifications, the Interactive Health Care Eligibility/Benefit Inquiry Message and the Interactive Health Care Eligibility/Benefit Information Message, will enable health care institutions to use EDI for time-sensitive applications.

For example, a hospital could use interactive EDI to see whether an emergency room patient has insurance and is eligible for care.

These interactive specifications will represent the first ASC X12 standards written in the internationally accepted EDI for Administration, Commerce and Transport (EDIFACT) syntax.

Interactive EDI can help speed the processing of messages by reducing their size. To support the technology, users and vendors may need to retool some of their existing EDI software packages.

Interactive EDI has started taking hold in the health care industry and others driven by fast turnarounds and more frequent information exchanges.

According to Pat Monahan, manager of external systems support at Blue Cross/Blue Shield of Rhode Island, interactive EDI's goal is to reduce transactions to an absolute minimum. She explained that the focus is toward "lean and mean."

Although Monahan is not sure when to expect new products based on the interactive EDI specifications, she said several users have set up pilots based on the draft specifications.

Torrey Byles, associate director of electronic commerce strategies at consultancy BIS Strategic Decisions of Norwell, Mass., said interactive EDI is a pivotal technology for the health care field.

"The interactive standards are critical to health care," he said. "The use of EDI for [patient] eligibility has been the Holy Grail in the health care industry."

Warehouse

Continued from page 42

"Today, if you're loading data, the whole table is unavailable while you do that. With VPT, I can load data but still have access to the table," said Claude Danvers, director of database administration at H.E. Butt Grocery Co. in San Antonio, Texas.

New data warehouse wares

Product	Function	Distinguishing features
Red Brick Warehouse VPT	Sets up data warehouses up to 500G bytes.	Supports parallel processing computers.
SourcePoint	Client/server software used to load and refresh warehouse data.	Works with several Unix databases, including Oracle7, Sybase SQL Server, CA-Ingres and Informix On-Line.

"The nature of these applications is such that the users don't know exactly what they're looking for in the data, which means they need to repeat queries. Therefore, performance is key," said John Mann, analyst at The Yankee Group, a market research firm in Boston.

Red Brick Warehoue VPT runs on a variety of Unix computer systems.

Available next month, Red Brick Warehouse VPT will start at $72,000 per server.

STRAIGHT TO THE SOURCEPOINT

Software AG SourcePoint will be used to load, massage and refresh data destined for a data warehouse. It will work with a variety of databases, including Oracle7, SQL Server 10, DB2 and the company's own Adabas D.

SourcePoint consists of a Unix-based server component and a Windows client. The server component, which resides on the same machine as the data warehouse, maps production database data to warehouse data structures and then inserts, updates and loads data into warehouse tables. The client component is used by administrators to schedule data extracts and manage those extracts.

A SourcePoint application program interface is required on any server from which data is collected.

Available in the first quarter of 1995, SourcePoint will cost $30,000 per server.

☎Red Brick: (408) 399-3200; Software AG (703) 860-5050.

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Circle Reader Service #**54**

PRODUCT
OBJECT TOOL KITS
ROUNDUP

Unify builds apps partitioning into development tool upgrade

Teknokron and HP ready object-based software.

BY ADAM GAFFIN

Unify Corp. is readying a new version of its client/server development tool kit that includes multiplatform support, application partitioning and other features aimed at enterprise developers.

Unify Vision 2.0 builds on an existing graphical application developer and can be used to create more scalable applications than could be done with the previous version, the company said.

The software's partitioning technology is a key to building scalable applications. It lets developers build applications to run among a variety of client and server components to most effectively use a network's processing resources.

Building applications

Product	Pricing	Availability
HP's Distributed Smalltalk 4.0	$2,995- $4,995	Dec. 1
Teknokron's Enterprise Toolkit	$2,000- $20,000	Now
Unify's Unify Vision 2.0	$4,995	January

The partitioning technology also hides underlying network protocols from the developer.

The software supports a variety of back-end databases and Unix, Windows and Macintosh clients.

Also new to Version 2.0 is integration with Tivoli Systems, Inc. distribution software, which allows for the deployment of application objects across a network and support for distributed object-naming services to track those objects.

Version 2.0 also boasts application program interface hooks for its object repository to let developers link it to computer-aided software engineering and configuration management applications. The repository lets teams of developers share objects.

ORB-BASED TOOLS

Separately, Teknokron Software Systems, Inc. last week said it is readying an object request broker (ORB)-based tool kit for building applications that can run across a heterogeneous network. The software can also be used to provide replication among disparate relational databases.

The company's Enterprise Toolkit consists of a series of modules that include its Teknokron Information Bus ORB, which features server and client components. The ORB can be used to keep track of available information resources on a network and how to access them so that a developer need only point to the resources, rather than trying to figure out where they reside and what communications protocol is needed to get to them.

Other modules include a series of rapid application development tools and APIs.

One unique feature of the tool kit is that it can be used by a developer to design applications in which a remote object can be moved to a client for a procedure, rather than requiring the client to invoke the procedure remotely. Teknokron said this feature can reduce network traffic, especially for remote and mobile applications.

The tool kit can be used to implement data replication among heterogeneous databases via an object layer that sits atop databases from Oracle Corp., Sybase, Inc. and Computer Associates, Inc.

The Teknokron ORB software then acts as middleware, translating data within the databases into objects that can be exchanged across a network.

Supported platforms are Unix and VMS servers, as well as Windows clients.

HP TALKS UP SMALLTALK

Also last week, Hewlett-Packard Co. announced an upgraded version of its Distributed Smalltalk development tool kit, which can be used to build applications for Windows, Windows NT and OS/2 platforms. Earlier versions of the software supported HP-UX, Solaris, SunOS and AIX platforms.

Version 4.0 features a Common ORB Architecture-compliant ORB built on ParcPlace Systems, Inc.'s VisualWorks 2.0 software for building client/server applications. HP said it plans to add support for Object Technology International, Inc.'s ENVY/Developer team development software, as well.

©HP: (800) 637-7740; Teknokron: (415) 325-1025; Unify: (916) 928-6400.

A smart way to sp

Start-up firm offers secure new Internet-based shopping service

BY ADAM GAFFIN

Cambridge, Mass.

Open Market, Inc. last week launched a one-stop Internet shopping service that will offer participating vendors everything from forms-based design of their on-line catalogs to secure interfaces with credit card companies.

Initial customers include Digital Equipment Corp. and Mead Data Central, Inc., which owns the LEXIS/NEXIS databases.

Key to the system are "Internet cards" that will function like on-line credit cards, according to Shikhar Ghosh, chief executive officer of Open Market.

Internet users will be able to apply for these free cards through forms on World-Wide Web servers run by Open Market and its customers. Then, when users attempt to order something from a participating merchant, their requests are forwarded here to an Open Market server, which responds with random challenge questions based on data on the users' applications.

If they can answer the questions, the orders are then forwarded to the merchant and to the users' actual credit card companies.

This payment system is similar to one employed by Cheyenne, Wyo.-based First Virtual Holdings, Inc., which also opened up shop on the Internet this week. The company had backing from partners that include Electronic Data Systems, Inc. and First USA, a Dallas credit card company.

Ghosh said a server-based security system eliminates potential problems caused by incompatibilities between public key-based WWW clients. Still, he said, Open Market will also support such clients. The firm is also working to develop secure ordering systems based on smart card technology.

Also key to Open Market's success is an on-line system new merchants can use to create WWW interfaces by filling out forms rather than building their own "home pages."

Users will be drawn to the mall by the ability to search through offerings of several vendors at once, by creating a WWW document that shows the selected items for comparison, known as a "shopping cart." Open Market is working on a similar system for delivering customized news feeds, Ghosh said.

> **"What Open Market has done particularly well is to think through the process of getting somebody who doesn't know anything about the Internet up on the Web."**

GETTING THEM STARTED

"What Open Market has done particularly well is to think through the process of getting somebody who doesn't know anything about the Internet up on the Web," said Jerry Michalski, managing editor of *Release 1.0* in New York, who follows the field.

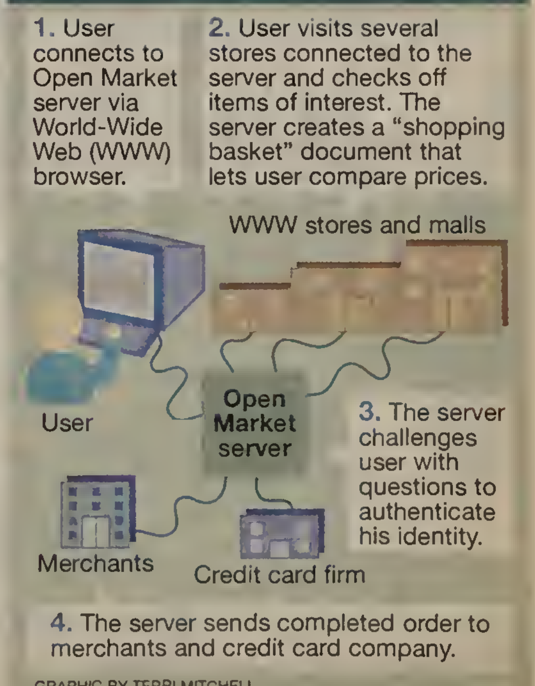
One company that might not seem to need any help is Digital, which already has its product catalog on-line.

But currently, only large Digital customers with established accounts can order directly from the catalog.

According to Philip Faulkner, business development manager for electronic banking at Digital, his firm is looking to Open Market to establish a new market among casual Internet shoppers – for example, people who might be in the market for a single personal computer. Faulkner said a particularly attractive aspect is the way Open Market will serve as a clearing house for credit card companies, freeing Digital from having to handle the task.

©Open Market: (617) 621-9500; WWW Uniform Resource Locator: http://www.openmarket.com.

Shopping on the Open Market


1. User connects to Open Market server via World-Wide Web (WWW) browser.
2. User visits several stores connected to the server and checks off items of interest. The server creates a "shopping basket" document that lets user compare prices.
WWW stores and malls
User
Open Market server
3. The server challenges user with questions to authenticate his identity.
Merchants
Credit card firm
4. The server sends completed order to merchants and credit card company.

GRAPHIC BY TERRI MITCHELL

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EDITORIAL

The one that got away

Sometimes it's difficult to settle on a single topic for this space. This week, I could lambaste the carriers and cable companies for their frenzied matings in advance of the spectrum auction for wireless services. They're partners . . . no, rivals . . . no, partners again! What a grand spectacle of rationalization and Machiavellian maneuvering.

Or I could hit the FCC for failing, in its recent video dial tone decision, to establish firm rules ensuring that ratepayers don't foot the bill for the RBHCs' speculative forays into the cone of the convergence volcano.

But those topics will have to wait in light of Cisco's surprise purchase of Kalpana. Simply put, Cisco stole Kalpana out from under IBM's nose.

For weeks, we've awaited official word of IBM's acquisition of Kalpana, which owns a big chunk of the small, but potentially huge, Ethernet switching market. I met with a top Kalpana official just a few weeks ago to discuss how we might cover that deal when it was finalized.

This turn of events is disastrous for IBM and not just because it reaffirms the company's image as a lumbering hulk in an industry dominated by nimbler, more aggressive rivals. More important, Kalpana would have given IBM a sorely needed control point in emerging switch-based networks, something IBM desperately needs for account control.

As I've discussed before, IBM is struggling to maintain its hold over customers because it doesn't control the key enterprise network underpinnings, from desktop and network operating systems to hubs, routers and switches.

Kalpana would have given IBM a chance to control the connections to millions of desktops in the future, and its switches would have been an ideal complement to IBM's emerging ATM products. Kalpana's products could have opened the way for new IBM equipment sales.

Now Cisco will control those connections and will have an easier time selling its vision of the future.

Some analysts say that at $207 million, Cisco paid too much for Kalpana, which will earn between $35 million and $40 million in revenue this year. Perhaps that's true for Cisco, which already has some interesting switching technology from its purchase of Crescendo Communications. But Kalpana would have been worth 10 times revenue to IBM in terms of future account control.

IBM was outmaneuvered, and that's particularly ironic given the news out of IBM just two weeks ago. In announcing improved quarterly results, a senior IBM financial executive said the company was looking to make some very high-level acquisitions in the months ahead.

Well, Kalpana was only a small fish. But it slipped off IBM's hook, and this fish is likely to swim back and bite Big Blue in the future. Some of the money IBM is rumored to be stockpiling for a deal to get access to the Macintosh operating system would have been better spent on landing this prize.

➺JOHN GALLANT jgallant@world.std.com

TELETOONS

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NIGHT OF THE MUTANT TEENAGE HACKERS
THEY'VE...CRASHED THROUGH SECURITY!! THEY'RE..EATING OUR BANDWIDTH ALIVE!!
PLEASE HELP US!!
PHIL FRANK

YANKEE INGENUITY

by Howard Anderson

Networking and religion are a match made in heaven

Every week, they come. Droves of vendors, clogging our conference rooms, muttering incantations, each one more righteous than the next. They come with their slide trays under their arms, with overheads like so many burned offerings.

And then the users come with never-ending questions. Questions about protocols, fundamental direction and whom to follow.

Suddenly it became clear to me: This isn't an industry, it's a religion, full of passion plays, intrigue, prophets, nay sayers and gatekeepers. I knew it was time to give the Big Guy a call.

Me: We want to start a new religion.

God: I already have enough religions, and the evaluation criteria are stringent. What is this new religion you believe is worthy?

Me: Networking.

God: OK, let's go through the checklist. Does this religion have high priests? Prayer meetings? Dogma?

Me: Do we ever! We've got Vint Cerf, Andy Ludwick, Bob Allen and Ray Noorda. Last year, thousands of faithful followers attended INTEROP, all genuflecting to the ATM model. Dogma? How about TCP/IP and SNMP for starters?

God: It is a beginning. But before I authorize a new religion, I need certifiable miracles. Can you offer any testimony?

Me: No problemo! We call them case studies. They are one-time cataclysmic events involving such revered icons as American Hospital Supply, Wal-Mart and the perpetual favorite, Otis Elevator. And what's even better, while they occur only once, the multitudes speak of them in hushed tones for generations.

God: Good, good. Now, I need a Moses, a visionary that will lead you to the promised land and give you laws.

Me: How about Bill Gates and Windows NT?

God: Windows NT? I live in eternity, but even I am not that patient. By the way, did you hear the one about how many Microsoft engineers it takes to change a light bulb?

Me: Yes, I heard it. None; Bill just declares darkness the industry standard. Can we get back to our discussion, please?

God: OK, let us get down to a few secular concerns. What are you going to do about tithing? Raising money for churches?

Me: Tithing? How about the king's ransom we pay for site licenses to Cisco, Cabletron and AT&T? As for fund-raising, the venture capitalists are hovering.

God: Did I ever tell you that it is easier for a camel to pass through the eye of an needle than a venture capitalist to . . .

Me: With all due respect, you stole that from Paul Severino of Wellfleet.

God: God does not steal. He borrows with attribution. But speaking of that – what are you doing about commandments?

Me: We have only one: Thou shalt never take network advice from a Suit; trust only the Ponytails.

God: And a good commandment it is! Now tell me – have you ever had holy wars?

Me: Ethernet vs. token ring! FDDI vs. ATM! Bridges vs. routers! Trust me, God, we are long on holy wars.

God: Very impressive, but certifying a religion requires more – it takes a body of knowledge to keep the believers pious. I've always been partial to the story of the burning bush. What do you have?

Me: No burning bush, but we've been having a religious convocation on Source Routing vs. Spanning Tree.

God: Close enough. Let's go on – any self-professed zealots with their own view of salvation?

Me: Ever been to an ATM Forum meeting?

God: I said zealots, not crazies. What about evangelists?

Me: What do you call The Yankee Group? And by the way, can you do something about people in the south calling us damn Yankees?

God: My powers are only so strong. But I do have the Whole World in My Hand – what do you have?

Me: The World-Wide Web.

God: Try it in Latin, maybe it will do. Now, tell me about your view of heaven.

Me: Everything interoperates. No collision detection because nothing collides. Everyone agrees on 53-byte cells.

God: And hell?

Me: Everyone is screaming, "It came out all right on my end." And the software guys are blaming the network, and the network guys are pointing fingers at the hardware guys. Nothing works because the systems integrators are always out for coffee.

God: No, they're not. They're waiting for their checks. It's called purgatory.

Me: Purgatory? No wonder they're not getting back to us. I always knew that there would be a special place in hell for the systems integrators.

God: Where do you think the phrase "crash and burn" came from? Anyway, let's go on. What are you doing about a Children's Crusade?

Me: Got it covered. Meet my LAN administrators.

God: Good. Any acts of divine kindness?

Me: Well, Al Gore has stopped talking about the Information Superhighway.

God: His version of *Highway to Heaven*. One more bad pun about roadblocks or detours and I would have had to call him home.

Well, this is all fine and good, but I could use a few more biblical tales. You got anything like Jesus feeding the masses with just a few loaves of bread and a couple of fish?

Me: In spades. What do you think a shared LAN medium is, anyway? By the way, what *do* you use for a LAN medium up there?

God: We go wireless.

Me: Makes sense. Well, tell me – do we have enough to become a new religion?

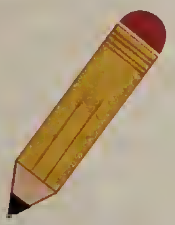
God: See that white puff of smoke?

Me: Does that mean that we're in?

God: No, dummy. It means the server failed. And I thought you knew networks.

➺ Anderson is managing director of The Yankee Group and a founder of Battery Venture Capital, both in Boston
He continually fights to keep his skepticism from degenerating into flaming cynicism – a battle he seems to be losing
He can be reached at (617) 367-1000

Letters



Good article

Kevin Fogarty's article "Workflow, imaging help bank cash in" (Sept. 19, page 1) was very well written and useful.

As you may know, the National Performance Review has highlighted imaging and workflow technology application along with decentralization of data processing as key technologies. Selling such solutions at lower levels is not always easy. The difficulties inherent in procuring anything substantial for a government agency – requests for proposal, analysis of bids, arbitration of appeals – tend to discourage business area managers, who are responsible for budgets and procurement decisions, from innovation.

This sort of short description of a successful reinvention process and its benefits, in a similar, worldwide, bureaucratic enterprise, can go a long way in encouraging us to take risks that we might ordinarily avoid.

Good work!

J.B. Fields
Computer analyst
U.S. State Department
Washington, D.C.

Story time

Congratulations on the fine piece "Plan now for fallout from new switched access deals" by Mary Johnston Turner (Sept. 26, page 40).

At a recent conference in Washington, D.C., John Malone, president of Tele-Communications, Inc., said, "We are market-testing whether we can find enough added revenue to justify two wires to every home. Unless we can find added revenue, then there is not going to be competition for home service."

The great media story on the battle between the cable and telephone companies may not turn out to be a story after all.

Art Barber
President
PrivateNet, Inc.
Bethesda, Md.

Alive and well

In your brief "Save the LANalyzer" (Oct. 3, page 2), we believe you have misrepresented the future of Network Communications Corp. (NCC) and its products. Contrary to what appeared in print, NCC is committed to the ongoing development, support and future enhancements of LANalyzer as well as the Network Probe product lines.

The primary objectives of the reorganization were to refocus NCC to be more responsive to customer needs and to strengthen the company's financial position. Within the past several weeks, NCC has taken significant measures to construct the future of both the LANalyzer and Network Probe product lines.

We can assure you that the future of each product is innovative and exciting. If your readers have any questions with respect to our seriousness in the communications industry, they

See **Letters**, *page* 49

NET-WHERE?

by David Coursey

Server delays stalling market

I have this dream in which Alex Trebek is hosting *Computer Jeopardy*. I'm a contestant, along with Ray Noorda, and Bill and Melinda Gates' son, Bill 4.0. We're into Final Jeopardy, the game is about to be decided, and the answer is: Sequoia.

Ray buzzes first but forgets his response. Bill 4.0 is strangely mute. The camera points at me. I answer, in proper *Jeopardy* question format, "What is the code name for the new server for cc:Mail that Lotus Development Corp. has been promising for three years and still hasn't delivered?"

Then I wake up in a cold sweat, which is about what happens whenever I have to think about cc:Mail and the new engine, which seems to have become a Notes-based enterprise-strength E-mail system – unless, of course, Lotus' recent purchase of SoftSwitch, Inc. has thrown another wrench into the works.

And to be honest, I'm not sure the "three years" part of my response is really correct. Three years is the earliest reference I can find, but it could be longer, or Lotus might say the product wasn't really announced that early. Presumably, someday Lotus will ship Sequoia or some son-of-Sequoia. When that happens, we'll crack open the disks and verify its age by counting the rings, the same way scientists date those giant trees.

Poor cc:Mail users! While Lotus has waffled back and forth trying to decide whether it really is or isn't trying to foist Notes on people who don't want it, the ship date for the new mail server, now called Lotus Communications Server, has slipped and slipped. Lotus was talking about a mail server three years ago; now it isn't due until early 1995. But can we really believe a company that has missed as many ship dates as Lotus has? Probably not, especially since a friend of mine who works near Lotus' E-mail development center says he never sees any lights on late at night.

If you're not an E-mail administrator, this may not seem very important. But every LAN E-mail user is affected by how well the server does or doesn't work – and by what features it does or doesn't offer. In the case of cc:Mail, this is a problem because Lotus is well behind the curve, and Microsoft Corp. is closing in. And there's a double-whammy: cc:Mail may be showing its age, but in my experience, Notes Mail is even worse.

Why do I care? Because I am one those poor cc:Mail users I mentioned earlier, but also because keeping track of products that have been promised, yet haven't shipped, is part of my job. There is a name for this category of product wannabes, and you've probably heard it: vaporware. And as the keeper and curator of "The Official P.C. Letter VaporList," I am judge and jury for the most egregious cases of aggravated promotion of vaporware. My mission in this task is to chasten firms that announce their fantasies as real products in order to stall the marketplace, confound competitors and play with customers' minds, which is what Lotus has been doing with cc:Mail.

Lotus cc:Mail badly needs a new server. The program is not client/server-based, for example, and the directory structure doesn't support user-created directories of mail recipients. The software also hasn't really moved into the age of mobile computing, despite Lotus' having carried the existing architecture well beyond what I thought possible.

Lotus, however, doesn't have the low ground to itself in mail system vaporware. Microsoft has also been there with Exchange, the mail server it announced this summer but hasn't yet delivered.

The combination of these two vapor products has the mail market really messed up. I recently tried to help a large customer choose a new mail system and eventually had to throw up my hands. Until the Lotus and Microsoft servers ship, it's almost impossible to make a decision, especially since anything installed today is likely to be ripped out within a year or so. At the same time, Lotus' and Microsoft's delay has stalled the entire groupware category, which won't start to grow until every LAN user has access to a sophisticated messaging architecture.

Sure, companies need to tell their customers what they are up to, so we can't (and shouldn't) stop companies from preannouncing their products. But three years is much too long – especially for something as critical as E-mail.

➥ Coursey is editor of "P.C. Letter," a twice-monthly industry newsletter based in San Mateo, Calif. He can be reached via MCI Mail at 558-4460, via CompuServe at 76711,23 and via both AppleLink and America Online at dcoursey.

Where are they?

Product	Company	Announced	Original ship date	Revised ship date	Months in vapor
Telescript	General Magic, Inc.	Feb. 1993	4Q 1993	2Q 1994	20
OpenDoc	Apple Computer, Inc., Novell, Inc., and others	June 1993	2Q 1994	4Q 1994	16
Lotus Communications Server	Lotus Development Corp.	Sept. 1993	NA	1Q 1995	13
Windows95	Microsoft Corp.	Dec. 1993	4Q 1994	2Q 1995	10
Envoy	Motorola, Inc.	March 1994	1Q 1995	NA	7
NetWare for Apple PowerPC Servers	Novell and Apple	April 1994	4Q 1994	NA	6
Exchange	Microsoft	June 1994	2Q 1995	NA	4
Open Messaging Environment	Novell	Aug. 1994	Dec. 1995	NA	2
Various ATM products	First Virtual Corp.	Sept. 1994	Dec. 1994	NA	1

NA = Not applicable

Notes: Announced date is date on which product was either officially announced or became publicly known by some other means. Ship dates are based on official company information or best estimates.

SOURCE: "P.C. LETTER," SAN MATEO, CALIF.

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Help desk

Continued from page 2

try profiles, readers can access the Lynx Global Telecommunications Database, which is available via dial-up access, as a stand-alone PC version for Windows and in specialized publications. A CD-ROM version will also be available in the first quarter of 1995. Contact Lynx at (201) 256-7200 for additional information.

Do you know of any programs that will move and convert Digital Equipment Corp.'s Fortran Version 5.0 programs from our VAX 11/730 to our MS-DOS Version 5.0 Novell, Inc. NetWare LAN server?

Wayne Rickard, via the Internet

Harry Lipkind, a consultant and senior analyst at Corporate Software, Inc., a PC software products, support and systems integration company based in Norwood, Mass., replies:

I am not aware of a program that will move and convert the Fortran programs from your VAX to your MS-DOS NetWare server. However, you may not need one.

There are a number of complete Fortran 77 compilers available for MS-DOS: Lahey Computer Systems, Inc.'s Lahey Fortran 90 (LF90), Liant Software Corp.'s RM/Fortran and Microsoft Corp.'s Microsoft Fortran. LF90 costs $895, RM/Fortran is priced at $595, and Microsoft Fortran costs $169.

For more information about these compilers, call Lahey Computer at (800) 548-4778 or (702) 831-2500; Liant Software at (800) 237-1873 or (508) 872-8700, Ext. 319; and Microsof at (800) 426-9400. Applications processed with these compilers and linked with the appropriate libraries are fully supported on NetWare networks. When evaluating compilers, yo might want to run a few test subroutines fron the Fortran source through one or two selectec compilers. By selecting certain compile optio switches, the original VAX source Fortran ma compile without making any changes.

However, if a perfect match cannot b obtained, then your best bet probably woul be to pick the compiler that results in the fewest syntax errors with the original code.

The Fortran compilers that are available today will very likely have 99% or higher compatibility with the VAX source code.

Letters

Continued from page 48

should call NCC at (800) 451-1984 or contact any of our channel partners.

Kevin Rebman
Director of product marketing, LAN products
Stephen Stange
Director of product marketing, WAN products
Network Communications Corp.
Bloomington, Minn.

Editor's response: The brief never stated that NCC was not committed to the ongoing development of LANalyzer.

It simply reported that the new management team had "decided to slow the pace" of the development in order to focus on the company's WAN roots.

Several of the shareholders at the meeting said that that would certainly delay rollout of the next version, with some contending the project might be in serious jeopardy.

Furthermore, the brief addressed only the LANalyzer; the future of the company itself or any other products was never called into question.

Off-base

In the editorial "Congress doesn't get it" (Oct. 3, page 50), your assertion of the regional Bell holding companies' innocence regarding the demise of telecommunications reform legislation was way off-base.

Yes, the Senate version of the bill was a target of some dubious last-minute amendments, but if the RBHCs were so high-minded about real reform, why did they so strongly oppose the House version?

The fact is, the RBHCs and their operating companies are neither willing nor prepared for any level of real competition. Just ask them to embrace the Rochester Telephone Corp. model, which some of us consider a prototype for an open and competitive market structure. I doubt you will get any takers.

Any time you discuss a service or feature with an RBHC where the introduction of new capabilities will in some way threaten legacy revenue sources, the simple answer is no. Unless it provides for new revenue sources without such a threat, it never gets out the door. This warped point of view will hold back every network user from realizing the promises that new technologies offer. It will also eventuall lead to a crisis at each RBHC, as competitio (like it or not) erodes their nice, safe revenue sources.

The last big company that exhibited thi kind of head-in-the-sand attitude was IBM and it took a lot of luck (and the blood of man workers) to turn that around. I doubt the Bell will be as lucky.

Paul Weismante
Product manage
NEC America, Inc
Irving, Texa

Great expectations

I take issue with the closing statement o your editorial "Widen your horizons" (Oct. 10, page 38), which reads, "Don't settle for a quote from your standard supplier; now's the time t find out what's available and play these rival off one another for price concessions."

I'm sure you're aware of the margins tha most suppliers are working in today. To tel consumers to bargain even harder seems inappropriate and will cause significantly more heartache for resellers than exists now. I'm no suggesting that one shouldn't compare prices — I am suggesting that you may be raising the expectations of the buyer beyond what shoul be considered reasonable.

Tim Gales
Manager, network and system administratio
Empros Power Systems Control Divisio
Siemens Energy & Automation, Inc.
Plymouth, Minn.

Let us know what you think

Letters must include your name, title, company, city, state and a daytime phone number for verification. All letters are subject to editing for space and clarity. Letters can be mailed to Editor, *Network World*, 161 Worcester Road, Framingham, Mass. 01701, or sent via fax to (508) 820-3467 or via the Internet to network@world.std.com.

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Myriad of factors blur desktop video picture

Products are finally rolling off the production line, but users are still casting a cautious eye toward the camera.

KRISTEN MILLEA

INSIDE

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Survey says readers split between room and desktop systems. 59

By Christine Heckart

Price expectations

Users ideally want to pay $500 for desktop videoconferencing products but say prices that range from $1,000 to $1,500 are reasonable. Users are skeptical of paying more than $5,000, according to Anne Earon of InfoTech Consulting, Inc.

Recent technical improvements may be making videoconferencing products more ready than ever to stake a claim to desktop turf, but most users have so far been less than willing to yield an inch of valuable space.

The hesitancy stems partly from concerns about how desktop videoconferencing fits into strategic business practices that go beyond enabling the Mr. Spacely types in every organization to catch the George Jetsons of the world asleep at the switch.

Another factor keeping the now-ready technology from explosive growth is the fact that it's still a bit too expensive. In fact, despite some recent price declines, the cameras, video boards, microphones and software in today's second-generation desktop videoconferencing units can still wind up costing more than a basic personal computer. And then there's the ongoing cost of WAN links to consider.

Vendors are doing all they can to soften the blows of die-hard critics that say desktop videoconferencing is a toy and will never have practical applications. For instance, vendors argue that today's prices are actually low enough to cost-justify a purchase based on saving a single business trip per month.

Additionally, vendors say second-generation products have automatic configuration options that ease installation. Initial products kept technical support lines burning and required that end users know how to deal with the inner workings of desktop operating environments such as config.sys files in the DOS world.

Intel Corp.'s ProShare Video System 200 is considered by many users to be very intuitive and easy to learn (*NW*, July 11, page 45.) But end users still complain that it takes too much effort to learn how to establish videoconferencing sessions and use the data sharing capabilities many products offer.

On another front, progress has been made to improve the quality of desktop videoconferencing over low-speed, dial-up circuits. However, the picture quality generated by the video boards and software that act as a coder/decoder in desktop units is still poor compared to more functional room systems that operate over higher speed links and carry much higher price tags. Desktop units come close to matching room system quality when used over high-speed links. But its much more difficult to share desktop systems with other users than it is with a room system.

But where room systems have an edge in picture quality and are more easily shared, desktop units can operate over LANs, and work has been done to reduce the choppiness of packetized LAN video links.

There are now close to two dozen vendors offering a range of desktop videoconferencing products today. The vast majority of vendors offer completely integrated systems that include a camera, video boards, software, microphone, and a WAN or LAN interface card that can be installed in existing desktop computers (see Figure 1, page 53).

Other vendors such as InSoft, Inc. — a real pioneer in desktop videoconferencing — and Paradise Software, Inc. provide software only options that leave it up to users to acquire the video boards, cameras and microphones on their own.

Even room system vendors such as Compression Labs, Inc. (CLI) and PictureTel Corp. are getting into the act by rolling out desktop units.

Desktop videoconferencing units generate signals that can be displayed on a desktop computer's screen, which is most often a VGA monitor. A majority of vendors provide products that generate video for display on

Continued on page 53

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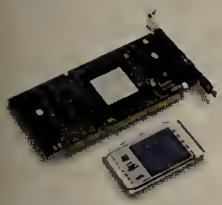

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NETWORK WORLD
SHORT LIST
1 9 9 4

Desktop video systems

The Short List highlights products Network World recommends you examine during the purchasing process for desktop videoconferencing systems. Products included on The Short List support different mixes of the following features: the ability to operate on different desktop computers; support for a variety of LAN and WAN interfaces; and support for application sharing that enables conference participants to make changes directly to documents. Some products also offer additional useful features, as noted. These criteria reflect the needs of users with multivendor enterprise networks. Your criteria may differ.

■AT&T
AT&T Vistium Personal Video System family

This product family is backed by AT&T's international support group for installation and service maintenance. AT&T can also provide the network links needed to connect the units. Both products in the family currently only run on a PC, but that drawback is outweighed by their ability to support true application sharing. The Vistium Personal Video System 1200 includes a single video board that compresses video and relies on the PC's CPU to decompress it, which frees up expansion slots. The Vistium Personal Video System 1300 has two video boards that perform both compression and decompression.

■InSoft, Inc.
Communique

A pioneer in the desktop videoconferencing market, InSoft's product is highly functional. For instance, its proprietary Desktop Video Everywhere (DVE) algorithm provides for interoperability among disparate platforms. DVE converts the compression format of another vendor's desktop videoconferencing unit for display on a unit running InSoft software. DVE also converts the outgoing video from an InSoft unit to the format required by the receiver. InSoft supports a mix of platforms, including Intel Corp. 80486- and Pentium-based PCs, as well as Unix-based workstations. In addition to supporting application sharing, InSoft offers a wide range of WAN interfaces and can run over TCP/IP-based LANs.

■InVision Systems Corp.
InVision 3.1

InVision breaks new ground with support for software-based multipoint conferencing. This capability enables four users to be displayed in separate windows on the screen. Although it only runs on 80486- or Pentium-based PCs and lacks full application sharing, the product's support for Novell, Inc. NetWare and TCP/IP LANs enables it to run over existing LAN internetworks.

■Nuts Technologies, Inc.
Connect 918 Desktop Video Conferencing System

The firm offers packages that run on a variety of PCs and Apple Computer, Inc. Macintoshes and is among the leaders in desktop videoconferencing over AppleTalk networks. The product can also run over NetWare- or TCP/IP-based LANs and an ISDN Basic Rate Interface circuit, support application sharing and enable users to adjust the number of frames transmitted each second to match available net bandwidth.

■Video Conferencing Communications, Inc.
TeleView family

The firm offers four different products, each of which fills a different need but runs only on 80386 platforms. The TeleView 2000 and TeleView Professional run over NetWare-, TCP/IP- and Network Basic I/O System-based LANs. The TeleView 1000c and TeleView 2000 include software that spreads video across as many as four 28.8K bit/sec analog lines for an effective throughput of up to 115.2K bit/sec.

Continued from page 50

larger monitors supporting National Television Standard Committee (NTSC) signaling in the U.S. or phase-alternating line (PAL) signaling internationally.

However, while VGA monitors can easily display computer-generated text and graphics alongside video on the desktop's monitor, sending text and graphics to an NTSC or PAL monitor is a different story. To accomplish this task, users need additional hardware to convert the computer's VGA signal to an NTSC or PAL signal, says Alfred Riccomi, president of Multimedia pc Systems, a management consulting firm in Richardson, Texas. Such converters are available as add-on products from a variety of sources including desktop videoconferencing vendors.

These monitor options are among the many factors that make buying desktop videoconferencing a complicated task.

Some of the other issues include how the product compresses and decompresses video, whether desktop units can interoperate with each other and with room-based systems, and how multipoint conferencing is accomplished. Lastly, users will want to know whether it's possible to view each other while collaboratively working on shared documents or writing on electronic whiteboards and how audio is handled.

AN ATYPICAL MARKET

The desktop videoconferencing market has an atypical segmentation compared to other markets, mostly because of its infancy. There is no clear-cut distinction between high- and low-end products. Rather, the products are fairly comparable, differing widely only when it comes to the platform they use, the type of network connection they use and the amount of application sharing they permit.

The vast majority of products run on Intel 80386-, 80486- and Pentium-based PCs. Only a scant number of products including those from InSoft, Datapoint Corp. and Paradise Software can run on high-powered Unix-based workstations. Finally, a few companies including CLI, Datapoint, Northern Telecom, Inc. and Nuts Technologies, Inc. have products that run on Apple Computer, Inc. Macintoshes.

Many of the products were originally designed to work over circuit-switched WAN links that provide the type of constant bit rate that video prefers. Products with a heritage in the circuit-based WAN environment support ISDN, switched 56K bit/sec as well as fractional T-1 or full T-1 private lines. Vendors are pledging support for emerging Asynchronous Transfer Mode services. Typically, these systems comply with ITU-T's H.320 suite of standards designed for interoperability among disparate units.

A number of vendors now have products that operate in LAN environments. Some of the vendors with heritage in WAN links have added LAN interfaces. Other firms such as CLI, InSoft, InVision Systems Corp., Nuts Technologies, Paradise Software, PictureTel and Viewpoint Systems, Inc. have designed LAN-based products that can pass traffic over existing WAN links.

LAN-based units packetize video signals, which forces vendors to implement special software to overcome the loss of a constant bit stream offered by circuit-switched links. On the plus side, LAN-based products can feed packetized data into existing internetworking devices for transmission over existing backbone nets, particularly those that support TCP/IP or Novell, Inc.'s IPX.

Interoperable info

The "Personal Conferencing Specification Release 1.0," a guide examining interoperability among disparate systems, applications and networks, will be available to users by year end. For more information, call the Personal Conferencing Work Group at (503) 696-6070.

However, products with a LAN heritage typically lack support for H.320 because that standard was not designed to work in packet environments that add unpredictability to data delivery. Instead, the products are using proprietary packetization schemes until a standard is defined.

Finally, the more functional products will offer a variety of conferencing features, such as graphics annotation and document sharing. At the high end are products that provide true application sharing that enables conference participants to view and change the same document. These products also provide shared electronic whiteboards and shared annotation capabilities.

At the low end are packages that allow shared annotation as well as the ability to remotely view documents. But these units fall short of enabling conference participants to make changes and additions directly to shared documents.

Vendors often implement proprietary tools to enable data sharing features. Intel is a leader in this area with its ProShare Premium software. Intel has worked with a coalition of other vendors to create the Personal Conferencing Specification (PCS), which defines how data files can be shared during a videoconference.

PCS goes beyond H.320's definition of audio and videoconference interworking to include screen sharing and collaboration. PCS also defines a standard for supporting desktop videoconferencing over a LAN.

The ITU-T is developing its T.120 standard for sharing data and collaborative computing. T.120 is currently independent of existing video and audio standards, but the ITU-T has considered adding it to the H.320 suite, Riccomi says. Most vendors with collaborative products, such as those based on PCS, are shying away from T.120 for the moment because they say it falls short of what they can already accomplish.

COMPRESSION CHAMBER

The linchpin in all products is the video codec boards and software used to compress and decompress video. In some cases, a desktop videoconferencing vendor makes its own boards. This is the case with Intel, which supplies boards that use its Indeo compression algorithm. Others use proprietary algorithms.

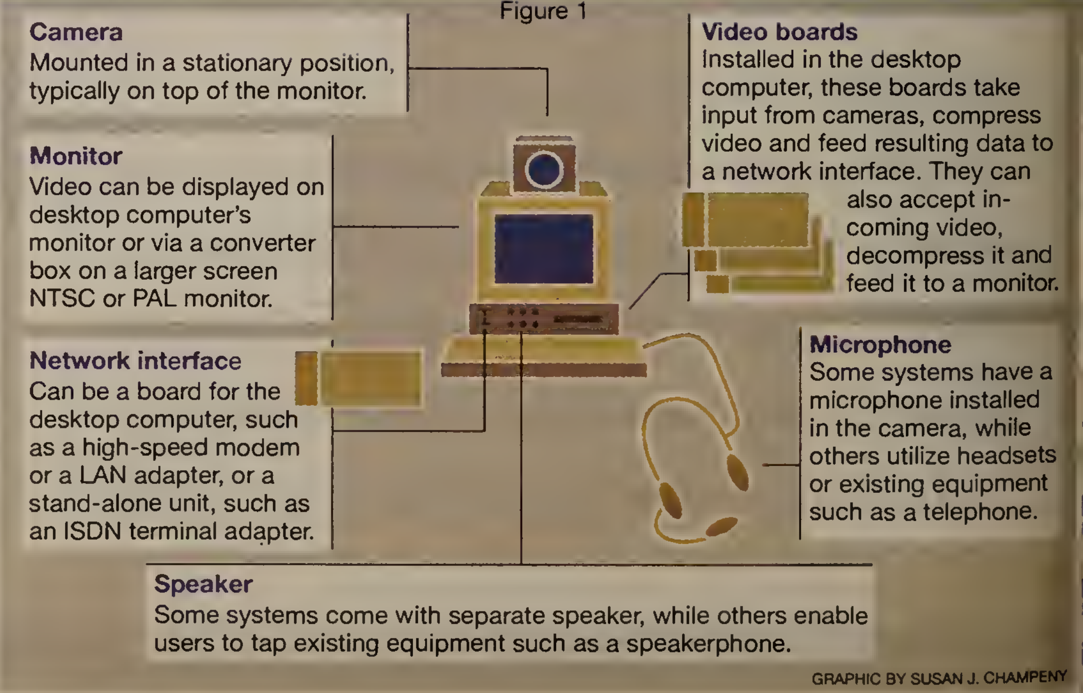
In other cases, vendors acquire codec boards from third-party suppliers that implement a variety of compression algorithms, including the H.261 standard that is part of H.320. Intel's Indeo can also be found on third-party boards. Third-party board suppliers include Parallax Graphics, Inc. and Integrated Information Technology, Inc.

The boards capture images from cameras and compress the vast amount of data that makes up each frame. The number of frames sent per second often depends on the compression algorithm

Continued on page 57

The pieces of desktop videoconferencing

Figure 1



Camera
Mounted in a stationary position, typically on top of the monitor.

Monitor
Video can be displayed on desktop computer's monitor or via a converter box on a larger screen NTSC or PAL monitor.

Network interface
Can be a board for the desktop computer, such as a high-speed modem or a LAN adapter, or a stand-alone unit, such as an ISDN terminal adapter.

Video boards
Installed in the desktop computer, these boards take input from cameras, compress video and feed resulting data to a network interface. They can also accept incoming video, decompress it and feed it to a monitor.

Microphone
Some systems have a microphone installed in the camera, while others utilize headsets or existing equipment such as a telephone.

Speaker
Some systems come with separate speaker, while others enable users to tap existing equipment such as a speakerphone.

GRAPHIC BY SUSAN J. CHAMPENY

Desktop videoconferencing

Company	Product	Platform	Storage: (M bytes)	Bus	Audio	File format	Algorithm	Format	Service: Speed (Bit/sec)	LANs		Video signal	Features						Price
		3 = Intel 80386 4 = Intel 80486 P = Intel Pentium O = Other	D = Disk space R = RAM	E = EISA I = ISA M = MCA P = PCI O = Other	I = Inband O = Out-of-band	G = GIF M = Metafile P = PCX PI = PICT PS = PostScript T = TIFF	Type: Max. rate (Frame/sec) H = H.261 I = Intel Indeo J = JPEG P = Proprietary O = Other	F = Full Common P = Proprietary Q = Quarter Common	A = Analog F = Frame relay I = ISDN S = Switched T = Fractional, Full T-1	Type: E = Ethernet E100 = 100M bit/sec Ethernet F = FDDI I = Isochronous Ethernet T = Token ring T100= 100M bit/sec token ring O = Other	Protocol: A = AppleTalk I = IPX/SPX N = NETBIOS T = TCP/IP O = Other	N = NTSC P = PAL R = RGB	Application sharing	File transfer	Graphics document sharing	Multipoint conferences	Shared whiteboard	User control's refresh rate	B = Basic price/ Warranty (Months) U = Average per-user price
ASL Alpha Systems Lab (800) 576-4275	Mega-Conference	4	D: 10 R: 8	I	O		I: 7 J: (1)	F, Q	A: 28.8K			N, P		✓			✓	✓	B: $1,100/60 (2) U: $1,500
AT&T (800) 843-3646	AT&T Vistium Personal Video System 1200	3, 4, P	D: 10 R: 12	I	I	G, M, P, PI, PS, T	H: 30 J: (1)	F, Q	I: BRI T: 56K, 64K, 112K, 128K	E, T	I, N	N, P	✓	✓	✓	✓	✓		B: $2,595/12 U: $2,600
	AT&T Vistium Personal Video System 1300	3, 4, P	D: 10 R: 12	I	I	G, M, P, PI, PS, T	H: 30 J: (1)	F, Q	I: BRI S: 56K T: 56K, 64K, 112K, 128K, 384K	E, T	I, N	N, P	✓	✓	✓	✓	✓		B: $4,500/12 U: $5,500
Compression Labs, Inc. (408) 435-3000	Cameo Personal Video System	O	D: 20 R: 4		O	PI	P: 15	P	A: 22K I: BRI S: 56K	E	A			✓			✓		B: $1,499/12 U: $2,500
Comtech Labs, Inc. (415) 813-4500	PC-Vone	3, 4, P	D: 4 R: 4	I	I	G, M, P, PI, PS, T	H: 30 P: 30	F, P, Q	A: 9.6K, 14.4K, 19.2K, 28.8K F: 56K, 64K, 112K, 128K I: BRI S: 56K T: 56K, 64K, 112K, 128K		I, T	N, P		✓	✓		✓	✓	B: $3,995/12 U: $3,995
Datapoint Corp. (800) 334-9968	MINX Networked Video System	3, 4, P, O	D: <1 R: 4	I, O	I		H: 30	F	I: BRI, PRI S: 56K T: 1.54M		I	N, P	✓	✓	✓	✓	✓	✓	B: $17,995 (3)/ 12 U: $1,999
Intel Corp. (800) 538-3373	ProShare Video System 200	4, P	D: 7 R: 8	E, I	I	G, M, P, PI, PS, T	I: 15	P, Q	I: BRI			N	✓	✓	✓		✓		B: $2,499/36 U: $999-$2,499
InSoft, Inc. (717) 730-9501	Communique	4, P, O	D: 3 R: 16	E, I, M, P	I	G, P, PI, PS, T	I: 30 J: 30 P: 30 O: 30	F, Q	F: 56K, 64K, 112K, 128K, 256K, 384K, 768K S: 56K T: 56K, 64K, 112K, 128K, 256K, 384K, 768K, 1.54M	E, E100, F, I, T, T100, O	T	N, P	✓	✓	✓		✓	✓	B: $695/(4) U: $3,895
InVision Systems Corp. (918) 584-7772	InVision 3.1	4, P	D: 12 R: 8	E, I, M, P, O	I, O	G, M, P, PI, T	H: 30 I: 20 J: 15		A: 14.4K, 19.2K, 28.8K F: 56K-768K I: BRI, PRI S: 56K T: 1.54M	E, E100, F, T, T100, O	I, T	N, P, R		✓	✓	✓	✓	✓	B: $1,295/12 U: $1,495
KLT Telecom, Inc. (703) 502-1486	ViewShare	3, 4, P	D: 15 R: 8	I	I	G, P, PI, PS, T	H: 30	F, Q	I: BRI, PRI S: 56K T: 56K-768K, 1.54M	E, T	N	N, P	✓	✓	✓	✓	✓	✓	B: $6,500/12 U: NA
Northern Telecom, Inc. (800) 667-8437	Visit Video 2.0	3, 4, P, O	D: 5 R: 8	E, I, M	O	G, M, P, PI, PS, T	H: 15 P: 10	Q	A: 14.4K, 19.2K I: BRI S: 56K			N, P		✓	✓		✓	✓	B: $2,999/12 U: $2,999
Nuts Technologies, Inc. (408) 441-2166	Connect 918 Desktop Video Conferencing System	3, 4, P, O	D: 5 R: 8	I	I, O	PI	H: 30	F, Q	I: BRI	E, E100	A, I, T	N, P	✓	✓	✓		✓	✓	B: $3,999-$5,899/12 U: $4,999
Paradise Software, Inc. (609) 655-0016	PSVC	O	D: .542 R: 16	O	I	G, T	J: 30			E, E100, F, O	T				✓	✓		✓	B: $7,000/3 U: $7,000
PictureTel Corp. (800) 716-6000	PictureTel Live PCS 100 Release 1.1	3, 4, P	D: 20 R: 8	E, I	I	G, M, P, PI, PS, T	H: 15	F, Q	S: 56K T: 64K-384K			N, P	✓	✓		✓	✓	✓	B: $5,995/12
Target Technologies, Inc. (910) 395-6100	C-Phone	3, 4, P	D: 1 R: 8	I	I, O	G, M, P, PI, PS, T	H: 30 P: 30	F, P, Q	I: BRI, PRI S: 56K T: 56K, 64K, 112K, 128K, 256K, 384K, 768K, 1.54M	E, E100, I, O	I, N, T, O	N, P		✓		✓		✓	B: $1,995/12 U: $3,143
Video Conferencing Communications, Inc. (714) 452-0800	TeleView 1000c	3	D: 2 R: 4	E, I	O		P: 30	P	A: 115.2K (5)			N, P		✓	✓		✓	✓	B: $1,599/12 U: $2,499
	TeleView 2000	3	D: 2 R: 4	E, I	I, O		P: 30	P	A: 115.2K (5) F: 56K-768K I: BRI, PRI S: 56K T: 56K-1.54M	E, E100	I, N, T	N, P		✓	✓	✓	✓	✓	B: $1,599/12 U: $2,999
	TeleView 4000	3	D: 2 R: 4	E, I	O		P: 30	P	I: BRI, PRI T: 384K			N, P		✓		✓		✓	B: $6,999/12 U: $7,999
	TeleView Professional	3	D: 20 R: 8	E, I	I		H: 30	F, Q	I: BRI, PRI S: 56K T: 56K, 64K, 112K, 128K, 256K, 384K	E, E100, F, I	I, N, T	N, P		✓	✓	✓	✓	✓	B: $5,999/12 U: $7,500
Viewpoint Systems, Inc. (214) 243-0634	Personal Viewpoint	3, 4, P	D: 4 R: 4	E, I	O		P: 30	P		E, E100, F, I, T, T100, O	T	N	✓	✓	✓	✓	✓		B: $1,595/12 U: $2,000
VIVO Software, Inc. (800) 848-6411	VIVO320 Personal Videoconferencing	4, P	D: 5 R: 8	E, I	I	G, M, P, PI, PS, T	H: 15	F, Q	I: BRI				✓	✓	✓	✓	✓		B: $1,995/12 U: $1,995
VTEL Corp. (800) 856-8835	115S	4	D: 210 R: 8	I	I		H: 15, 30	F, Q	I: BRI, PRI S: 56K T: 56K, 64K, 112K, 128K, 384K			N, P	✓	✓	✓	✓	✓	✓	B: $9,995/12 U: $6,995

Chart compiled by Cheri Paquet

Products highlighted by color were selected for The Short List.

FOOTNOTES:
(1) Supports still video only.
(2) Labor warranty is for 12 months.
(3) Price is for a 3-seat starter system.
(4) Offers a maintenance program, including customer service and upgrades, which cost a percentage of configured product cost per year.
(5) Software allows 4 telephone lines operating at 28.8K to be multiplexed.

EISA = Extended ISA
GIF = Graphics Interface Format
ISA = Industry Standard Architecture
JPEG = Joint Photographic Experts Group
MCA = Micro Channel Architecture
NA = Not applicable

NTSC = National Television Standard Committee
PAL = Phase-alternating line
PCI = Peripheral Component Interconnect
RGB = A color model based on the mixing of red, green and blue.

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Bringing video to the desktop

To carriers, providing desktop videoconferencing is part of an emerging trend — delivering an integrated set of value-added services, hardware and support to the desktop.

The Big Three long-haul carriers all have videoconferencing services that utilize room systems (*NW*, Oct. 3, page 63). Now they are rolling out services that make use of desktop videoconferencing equipment.

AT&T offers its WorldWorx package, while MCI Communications Corp. counters it with networkMCI. Sprint Corp. has similar offerings that provide a comprehensive conferencing solution for integrating all of the hardware and network links needed to conduct point-to-point or multipoint desktop videoconferences.

Taking the concept of complete integration one step further, these systems will provide software and value-added services on the shared network, as well as technical help desks, scheduling and other enhanced features.

AT&T's WorldWorx is slated to provide point-to-point videoconferencing and dataconferencing services between desktop units. AT&T is working on a multipoint capability and will supply its own Vistium Personal Video System 1300 or Vistium Personal Video System 1200 desktop videoconferencing hardware. AT&T will also provide some conversion services geared at enabling AT&T and non-AT&T desktop videoconferencing units to interoperate.

Aside from videoconferencing, WorldWorx will support a number of other services, including digital 800 services. Digital 800 will support multimedia 800 calls that enable customers to retrieve images or video clips from their desktop computers. AT&T also has a service that will enable customers to establish dataconferences via a Lotus Development Corp. Notes server in the AT&T network.

MCI puts a slightly different twist on integration with its recently announced networkMCI Business package. The new package includes electronic mail and fax messaging, information services, automated news monitoring, document sharing and videoconferencing, online multimedia business catalogs and access to the Internet.

MCI is offering a complete package to customers to boost mass installation. MCI will sell the software needed to access networkMCI for $100, plus $65 per month for the daily news feed and $110 per month for the desktop video package, which includes video coder/decoder boards, audio boards, a camera and a speaker.

The ISDN connectivity needed to access networkMCI will be billed separately.

Users expecting to support a number of multipoint desktop videoconferences each year will want to examine the carriers' multipoint conference unit (MCU) services. With an MCU service, users schedule the videoconference ahead of time with the carrier. Each participant dials in to a carrier-owned MCU that interconnects all participants.

Carrier-based MCU services are typically voice-activated, which means the image of the person speaking is displayed on every screen as soon as the person starts talking.

> The Big Three long-haul carriers all have services that utilize room systems. Now they are rolling out services that make use of desktop videoconferencing equipment.

Continued from page 53

used, the on-board processing horsepower and the type of network link being tapped.

An acceptable video picture operates at 30 frame/sec and requires high-speed links, often running above 128K bit/sec. Many vendors drop their frame rate in order to squeeze a videoconference on slower speed links operating at 128K bit/sec or below such as ISDN Basic Rate Interface circuits or even dial-up analog circuits.

A codec board on a receiving unit is used to decompress the video. However, performing all compression and decompression on-board requires multiple boards, which take up valuable expansion slots on the desktop unit.

To free up slots, some vendors tap the desktop unit's CPU for part of the compression or decompression function. One vendor — Target Technologies, Inc. — uses a separate codec server unit to entirely off-load the process from the desktop (see Figure 2, this page).

Tapping the CPU can reduce the number of boards and may become a more viable option when desktop CPUs are even more powerful and as the drain compression and decompression put on processors is lessened with the advent of more efficient algorithms.

LINKING UP

There are two basic approaches to connecting desktop videoconferencing systems across a wide area: use a dial-up link such as ISDN BRI or a switched 56K bit/sec circuit, or use capacity on an existing enterprise network.

The H.320 standard is widely used to create circuit-switched links. Systems supporting H.320 typically operate using both 64K bit/sec channels of an ISDN BRI link or dual switched 56K bit/sec circuits, which usually provide enough bandwidth to support 12 to 15 frame/sec.

These dial-up links are useful for establishing periodic connections with users at other corporations or with locations without a tap into the enterprise network. Users typically have to specify which type of WAN interface they need as the product will come with a different board for different WAN links. However, some companies such as Comtech Labs, Inc. are supporting either ISDN or analog connectivity on the same board.

Other companies are making it easier for users to obtain the type of links they need from local carriers by establishing comarketing agreements. For instance, Intel has a program that makes ordering ISDN links as painless as possible.

Code-named Intel Blue, the joint marketing program allows users to order ISDN service from any Intel partner and specify the parameters of the ISDN connection. This saves time by obviating the need for users to deal with carriers separately, but it will only work in areas where ISDN is available.

Nationsbanc-CRT, a subsidiary of Nationsbanc Corp. in Chicago, used Intel Blue to acquire ISDN from Ameritech, says Frank Kavenik, vice president of development at the bank. "It was pretty hassle-free," he says.

Kavenik initially tried to convert some existing ISDN lines to support videoconferencing but met with problems in getting the circuit operating parameters correct. "With Intel Blue, everything is predetermined," he says.

For companies that want higher quality video or want to tap excess capacity on an enterprise network, there are products that operate at higher bandwidth. Some products offer ISDN Primary Rate Interface options that support video at speeds from 384K to 1.536M bit/sec, which is enough bandwidth to support rates reaching 30 frame/sec. Other firms offer support for leased fractional T-1 links that operate in increments of 64K bit/sec up to 768K bit/sec, while a few support a full T-1 leased line.

All the LAN-based systems operate over 10M bit/sec Ethernet, with a few running over token ring, as well. A couple of products such as InSoft's Communique and InVision's InVision 3.1 run over 100M bit/sec Fiber Distributed Data Interface LANs.

Products running over LANs use special algorithms to compensate for the variable delay between the time each video packet is sent and received. A few companies such as InSoft and Target Technologies support Isochronous Ethernet, which carves out a constant bit rate channel on Ethernet nets that is strictly for the use of video transmission.

Other vendors of LAN-based units are providing tools that enable users to manually adjust frame rates and, therefore, control how much capacity a given videoconference consumes or that automatically scale bandwidth consumption based on network utilization.

For instance, PictureTel will soon release Live LAN software that will enable its PictureTel Live PCS Release 1.1 to run over LANs and consume as little bandwidth as needed.

"The challenge with video over the LAN is to ensure the LAN performance is maintained," says Tony Paradisco, director of product marketing at PictureTel's Personal Systems Division. PictureTel will address this challenge through software that will automatically scale back on resolution or frames-per-second rates when bandwidth is at a premium.

An initial version of PictureTel's Live LAN software will support IPX and sell for $249. A version supporting TCP/IP is expected by the second quarter of 1995.

Viewpoint Systems' Personal Viewpoint offers a user selectable frame rate, which can dynamically adjust in real time as traffic loads vary. InSoft also provides an adaptive algorithm that scales frame speeds and video sampling rates in response to varying CPU and network loads.

LAN-based videoconferencing pioneer InVision is working on an algorithm that will sense video bandwidth consumption and make adjustments automatically. In the meantime, the company gives the user or systems administrator the ability to manually control the frame rate.

Datapoint offers a unique approach for LAN-based videoconferencing in campus environments. The company enables users to tap the spare cabling typically brought to each desktop to create a LAN dedicated to interconnecting its MINX Networked Video Systems (NVS). The video LAN can then connect into any WAN.

Desktop MINX NVS units are connected to a Datapoint Super Hub, a 768-port device that also supports WAN connections, or to a smaller Cluster Server, which supports 54 ports.

Video processors

Figure 2

Processors and software on video boards are used to compress and decompress video by 12 of the 18 vendors listed in the Buyer's Guide chart on page 54. Vendors with a different approach are:

- **AT&T, Intel Corp. and VIVO Software, Inc.** — Use the desktop CPU for decompression.
- **InVision Systems Corp.** — Compresses and decompresses video using both video boards and the desktop's CPU.
- **Northern Telecom, Inc.** — Uses a combination of the video board and CPU for decompression.
- **Target Technologies, Inc.** — Performs compression and decompression using a separate codec server.

GRAPHIC BY TERRI MITCHELL

Among the WAN links supported are ISDN, switched 56K bit/sec circuits, private lines, frame relay, microwave or even satellite links.

Pricing for a two-user MINX NVS configuration begins at $2,195 and includes the software, camera, speaker, microphone and codec. MINX NVS units will work with existing room system codecs, as well.

Northern Telecom adds yet another unique connectivity option. In addition to supporting ISDN and switched 56K bit/sec, Northern Telecom enables its Visit Video 2.0 units to connect into ports on its Meridian 1 private branch exchange, enabling customers to leverage their investments in existing PBX-based network interfaces.

WORKING TOGETHER

Getting units connected doesn't mean they'll interoperate. There are several factors to consider when evaluating desktop videoconferencing products that will work together.

One consideration is whether the desktop unit needs to interoperate with room-based systems. If this is the case, the desktop unit will most certainly need to be H.320-compatible.

CLI and PictureTel lead the market in room-based systems, but only PictureTel offers a desktop unit that interoperates with the codec used in its room system. VTEL Corp., with nearly 15% of the room-based market, also offers a desktop product that interoperates with its room system codec.

On the other hand, several vendors offer desktop products that are codec-independent and H.320-compatible, enabling them to interoperate at a base level with any H.320-compatible room system.

One distinctive feature to explore is finding out whether a desktop and room system codec can collaborate using electronic whiteboards and application sharing instead of just being able to exchange video. This is the type of full-function interoperability that PictureTel can offer by enabling its desktop and room system codecs to interwork.

When examining interoperability among disparate desktop units, H.320 is anything but the be-all and end-all. While H.320 compatibility helps, vendors have found other paths to interoperability. One is through proprietary conversion algorithms. For example, InSoft's Digital Video Everywhere protocol enables the software in its Communique product to convert one vendor's video image format to the format used by InSoft. If the disparate system supports H.320, Communique will default to that standard.

Using Windows as a default standard, which almost all vendors do, can also provide an interoperability path. In fact, Microsoft Corp. is reportedly working on a software application interface that will allow Windows-based desktops to receive and display H.320 and possibly Indeo video image formats.

For answers to questions about desktop videoconferencing, call the International Teleconferencing Association (ITCA), an educational organization that addresses all aspects of teleconferencing, at (703) 506-3280. The ITCA has 25 chapters nationwide and encourages users to join.

It's been said that H.320 compatibility drives prices up compared with systems that are not H.320-compatible systems. But Elliot Gold, president of TeleSpan Publishing Corp. in Altadena, Calif., disagrees.

"This is just simply not true," Gold says. "Intel says that H.320 isn't geared for the desktop, but then in April it announced that ProShare will include H.320 by the end of the year and that the upgrade will be free."

MULTIPOINT CONFERENCING

Users requiring connectivity among three or more units will see their product choices begin to narrow quickly and the price starts to increase.

There are three basic approaches to multipoint conferencing. Some vendors provide the ability to support four- or five-way conferences in software.

Offered by such vendors as Video Conferencing Communications, Inc. (VCC), Viewpoint Systems and InVision, this approach enables video boards to decompress multiple incoming signals and use a split-screen capability so that everyone can see everyone else. InSoft will offer a similar capability next year.

Another approach is to use a multipoint conferencing unit (MCU), which connects many more users into a conference and uses voice-activated switching to let everyone see who is talking when they start talking. However, MCUs are costly, ranging from $40,000 to more than $200,000.

VideoServer, Inc. is a leading provider of MCUs for desktop videoconferencing. Each desktop unit must have a LAN or WAN link into VideoServer's Series 2000 MCU, which then ensures that the image of the person talking is displayed on all screens. MCUs can be strung together to support a nearly unlimited number of participants.

Some desktop videoconferencing vendors resell the VideoServer MCU. AT&T, for example, provides multipoint conferencing from $60,000 to $200,000. VTEL provides a four-port VideoServer MCU for $50,000, with prices increasing by $5,500 for each port thereafter. PictureTel uses its own MCU.

Northern Telecom is at work to deliver by late 1995 a low-cost multipoint bridge that operates similar to an MCU. "Each bridge can support eight people, with the ability to link up to three bridges together for 20 participants," says Mark Lee, director of Visit Video marketing and sales. The product is expected to sell for $10,000 to $20,000.

The third alternative is to use leading carriers such as AT&T, MCI Communications Corp. and Sprint Corp., which plan to offer the ability to set up a multipoint desktop videoconference over public video nets using carrier owned MCUs (see story, page 57).

For users with distance learning or remote training applications in which a single person must be seen on many desktops, a broadcast capability is required. InVision offers broadcasting as part of its product at no additional cost. To support broadcasts in a LAN environment, packets from the originating desktop are addressed to be picked up by all other LAN nodes.

SHARING APPLICATIONS

Application sharing is another major way to differentiate desktop units. Most desktop videoconferencing systems offer shared electronic whiteboards and the ability to annotate shared documents. For example, CLI and VCC support capabilities that enable a person's image to be displayed in one window while data or graphics are displayed in another, but little else.

A limited number of products support true application sharing in which both parties can see a document and make changes directly into it. Intel's ProShare Video System 200 supports application sharing with the addition of ProShare Premier software. Several companies, including AT&T and VTEL, provide ProShare Premier as an integrated part of their product offerings.

In some cases, such as with InSoft, application sharing comes at an additional cost. Other companies, including Nuts Technologies, PictureTel and Datapoint provide application sharing as part of the base product.

The district attorney's office in Brooklyn, N.Y., sees application sharing as an important benefit. The office uses desktop videoconferencing to process arrests by linking several locations in Brooklyn to a central complaint room where case folders are prepared.

"We wanted to create a complete multitasking system," says Bob Kaye, deputy district attorney for case management. This means enabling remote police officers to draft an initial criminal complaint on a PC during the videoconference. The officer and victim could then read and modify the complaint in real time while the district attorney's office can capture pictures of any evidence or of the victim for introduction in trial.

HEAR YE, HEAR YE

How audio is supported is yet another way to differentiate products. The challenge here is synchronizing the audio signal with the video so users don't end up feeling like they're in the middle of a bad Japanese ninja film with English dubbing. In most cases, the audio signal is artificially delayed by software so that it arrives at exactly the same time as the video signal, which is delayed by the compression/decompression process.

Another approach is to use a separate telephone such as a speakerphone or headset to send audio. This results in sending the audio out of band from the video and requires the receiving unit to synchronize the two. One of the purported advantages of this approach is that people without a desktop videoconferencing unit can at least take part in an audioconference. Callers could also use other special telephone-related features such as call hold without interrupting the videoconference.

The alternative is to attach a microphone directly to the desktop device and send the audio alongside the video on the same circuit, an inband transmission technique. Inband audio is the more popular approach.

In fact, only a few products limit user options to just out-of-band audio. These products include ASL Alpha Systems Lab's MegaConference, CLI's Cameo Personal Video System, Northern Telecom's Visit Video 2.0, VCC's TeleView 1000c and TeleView 4000, and Viewpoint Systems' Personal Viewpoint.

LOOKING FOR THE BEST BUY

Price is always one of the biggest concerns in any product selection, and users researching desktop videoconferencing alternatives will see prices ranging from less than $1,000 up to $10,000.

To further confound users, some vendors are discounting their products heavily.

TeleSpan's Gold says the crazy pricing is the result of a young market in which vendors are trying to figure out what users are willing to pay for a product.

Continued on page 59

The pioneers of videoconferencing

The shelves may be well stocked with desktop videoconferencing products from a number of vendors, but for many users, the decision of which one to purchase is still a ways off. These users must first find strategic applications that will justify an investment in the technology.

Conducting pilot tests is one way users are seeking out possible applications. "Customers are definitely well into the market trial stage today," says Taya Harmon, marketing director for visual solutions at AT&T. "Customers initially buy four to six units and then use them to determine what business applications can be facilitated. After three to six months, they begin wider deployment."

Harmon says a fair number of users are buying into desktop videoconferencing once their trials are completed. In fact, she says AT&T has sold more than 1,000 of its Vistium Personal Video System products to 60 different customers. That figure excludes units being used in various tests.

"Video kiosks are becoming big business as more and more people figure out how to use that application," says Steve Rubery.

Users that have bought systems from Video Conferencing Communications, Inc. (VCC) find surveillance and video kiosks are key applications. Surveillance applications can be used to monitor traffic conditions on roadways. For example, transportation department personnel can dial into a camera mounted on a remote utility pole and capture images of traffic at major intersections or points of congestion, says Steve Rubery, senior vice president for VCC.

With a video kiosk, customers at remote locations can see and interact with central site service representatives. "Video kiosks are becoming a big business as more and more people figure out how to use that application," Rubery says.

Northern Telecom, Inc.'s Visit Video 2.0 is also being used in video kiosk applications. In fact, Northern Telecom says a bank uses its products in video kiosks that enable personnel to see remote loan applicants, while a pharmacy chain in Canada uses them to allow small town citizens to consult with a centrally located pharmacist. The pharmacy kiosk system also has a scanner that enables customers to transmit written prescriptions and a credit card reader allowing them to pay.

The district attorney's office in Brooklyn, N.Y., has put desktop videoconferencing into four precincts to ease congestion at its criminal processing facilities. "We have about 2 1/2 million people in this county," says Bob Kaye, deputy district attorney for case management in Brooklyn. "Before the video system, every police officer and every victim would have to come to a central site called the complaint room to have a complaint drawn up. PC video allows both the arresting officer and the victim to file the complaint remotely."

The district attorney's office has eight Northern Telecom Visit Video 2.0 systems installed — four at remote sites and four in the central complaint room. The units are interconnected via switched 56K bit/sec links today with the hope of using higher speed ISDN links to improve picture quality when that service is available in Brooklyn.

Kaye would also like to expand the system to include all 23 precincts as well as six downtown Brooklyn facilities.

"The most tangible benefits have been in the amount of money the police department has saved," Kaye says. Obviating the need for officers to travel to the compliant room has cut down on overtime pay and returns an arresting officer to the streets more quickly. "This is virtually unheard of in New York," Kaye says.

Continued from page 58

"Early adopters are less price-sensitive," Gold says. "There are [many] systems available that are inexpensive, and they aren't selling any better than their more expensive counterparts. You can't drive video to the desktop [through lower prices] to people that aren't ready."

But that isn't stopping the vendors. Intel is among the most aggressive. Intel's ProShare Video System 200 includes ProShare Premier software, a video capture card, a headset and earpiece, a camera and an ISDN card. The company is trying to increase market demand by working with carrier resellers to bring the cost down from the list price of $2,499 to less than $1,000.

Free trial

Most desktop videoconferencing vendors will provide versions of their software for a 90-day trial evaluation. But be careful: Users may still need to buy supporting hardware.

In California, for example, users can purchase Intel's product from Pacific Bell for $999. Carrier resale prices in other parts of the country range from about $1,200 to $1,500. To get this price, users must also buy ISDN service from the carrier.

To spur interest in its product, Northern Telecom recently cut the price of its Visit Video 2.0 by more than one-third — from $4,499 down to $2,999.

For users that need a PC with their desktop videoconferencing system, AT&T has one of the best deals available. An AT&T Vistium Personal Video System 1300 package that includes a PC, video boards, camera, audio system and ISDN cards is only $5,995. Dropping the PC from the product, which will run on 80386 machines, will only knock $200 off the price, essentially meaning users are getting the PC for next to nothing.

The Vistium Personal Video System 1200 is also a very good buy because it moves the video decoding to the PC's CPU and, therefore, is a single-board system that lists for about $2,600. But Gold says the street price is about half that much.

The PictureTel Live PCS 100 Release 1.1 includes an ISDN card, full application sharing using Live Share software, a camera, video boards and speaker phone for $5,995.

Today, InSoft's Communique, a LAN-based product that supports TCP/IP, can be purchased with an application sharing module for $1,750 or without the module for $695.

InSoft also provides its Conference Kit, which includes video boards, software, a camera and a microphone for use on a Unix workstation for between $3,500 and $7,995, depending on configuration.

A new marketing agreement between InSoft and Hewlett-Packard Co. is expected to produce a jointly developed ITU-T H.261 standard product by 1995.

Comtech Labs provides a complete product, including software, two boards, a handset and a digital color camera for $3,995. Viewpoint Systems, meanwhile, offers a product that has ISDN interfaces integrated on the video boards, which obviates the need for a separate ISDN terminal adapter and keeps the product costing $500 to $1,000 below comparable units.

Nuts Technologies gives users a choice between both the WAN interface and desktop platform they will use. The firm offers users a PC-based package with a LAN interface for $3,999.

Swapping an ISDN interface in for the LAN interface runs the price up to $4,999. A Macintosh system is also available with a LAN interface at a cost of $4,299 or with an ISDN interface for a cost of $5,899.

Those networking options are provided as part of a package that also includes the video boards, software, a speaker and a camera with integrated microphone. The company's Connect 918 Desktop Video Conferencing System supports full-motion video, full application sharing and file transfer, and is H.261-compatible. An H.320 version is due by year end.

NEW BUSINESS SOLUTIONS

All in all, the desktop videoconferencing market is on a major threshold. The personal conferencing revolution has the potential to change the way business is done.

"Customers are using the applications not just to see people at remote sites, but to change the way they do business," says Nancy Kopp, AT&T's visual desktop product manager.

Steve Richardson, vice president of product marketing at CLI, agrees. "The market is made up [primarily] of early adopters, pioneers and experimenters," he claims. "Users are exploring how desktop video will benefit the business. Efforts with Intel and its PCS workgroup are helping to drive commonalty in application at the video and application-sharing level. And that'll move desktop video into the mainstream."

Integrating videoconferencing into LAN operating systems could also help to make the technology more acceptable.

But aside from Microsoft, which has said desktop conferencing should be done over a LAN, little movement has been made to fold videoconferencing support into such network operating systems as Novell's NetWare.

Despite the current confusion, the desktop videoconferencing market is on tap for major movements over the upcoming months. Users that have yet to start trialing desktop videoconferencing had better do so soon. Chances are the competition already is.

➔ Heckart is a senior consultant at TeleChoice, Inc., a Verona, N.J., consultancy. She can be reached at (201) 239-0700 or via MCI Mail at 445-4690.

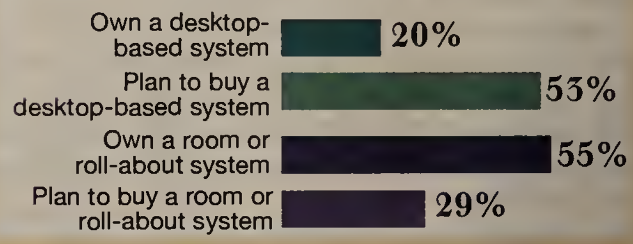
Reader views on videoconferencing

Based on 100 interviews.

Top selection criteria for videoconferencing systems
Based on highest possible score of 6.

Interoperability with other videoconferencing systems	4.73
Price and performance	4.71
Ease of management	3.84
Multiple types of network interfaces	3.41
Support for peripheral devices	2.69
Support for multiple file formats	1.90

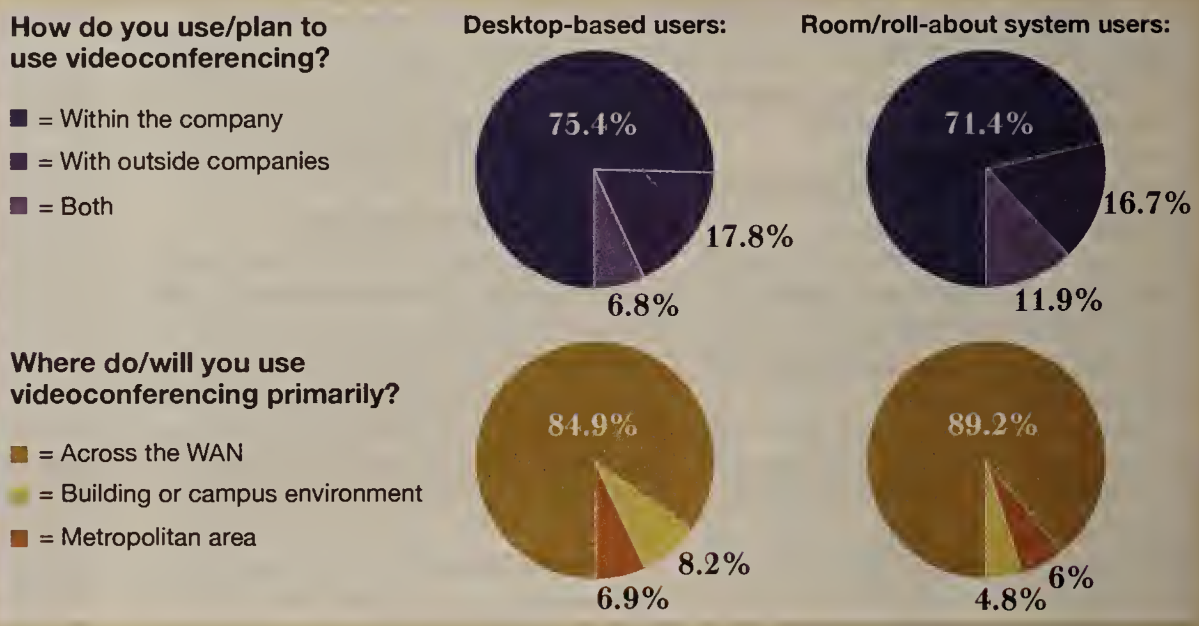
What type of videoconferencing system do you own/plan to buy in the next 12 months?
(Multiple responses allowed.)



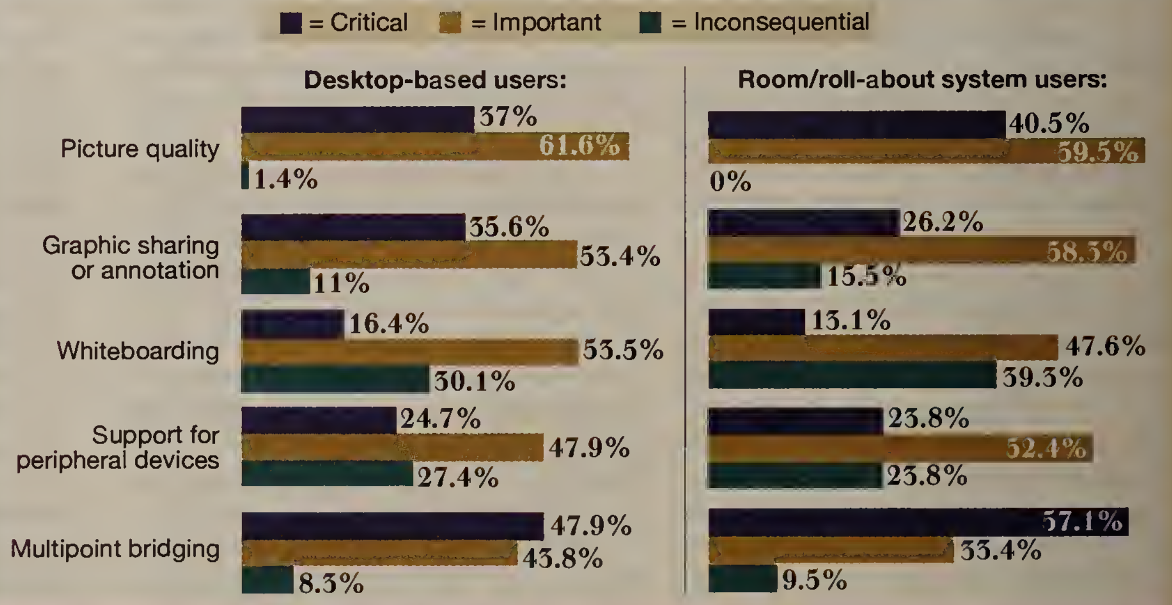
Key service and support issues
Based on highest possible score of 4.

Next-day availability of parts	3.04
Ease of installation	2.54
Free software upgrades	2.35
Toll-free hot line	2.09

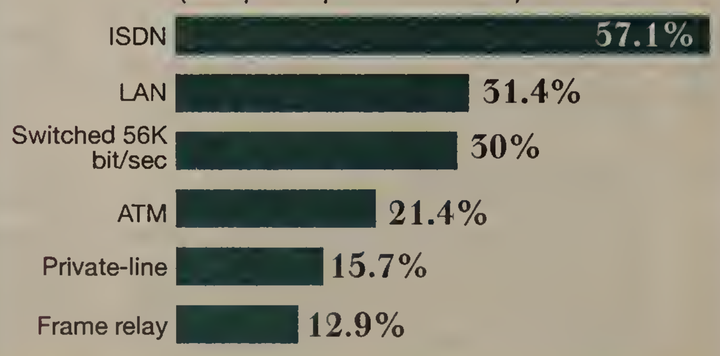
The remaining responses are those of 73 desktop-based users and 84 room/roll-about system users.



How important are the following capabilities when evaluating videoconferencing systems?



What connectivity or network solutions do you use/plan to use to support desktop videoconferencing?
(Multiple responses allowed.)



Based on responses from 70 desktop users.

Focus Data, Inc., an independent market research firm in Framingham, Mass., conducted this survey. Focus Data specializes in gathering primary data from end-user organizations regarding their enterprise network environment and needs. For more information on Focus Data services, call Mona Dabbon at (508) 626-2556.

GRAPHIC BY SUSAN SLATER

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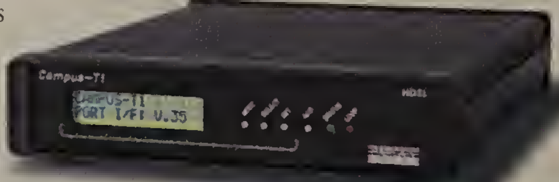

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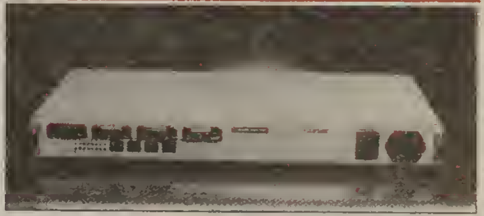

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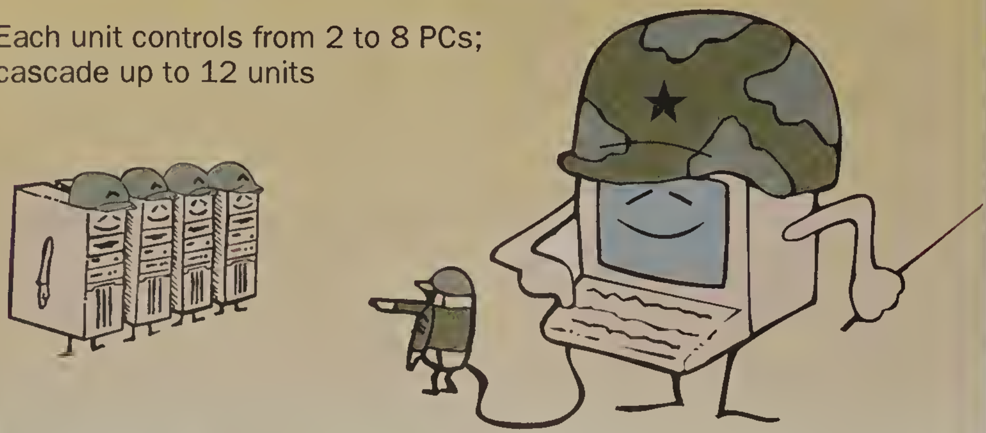

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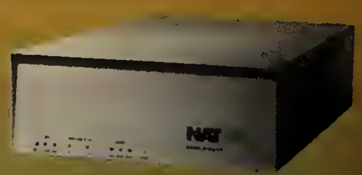

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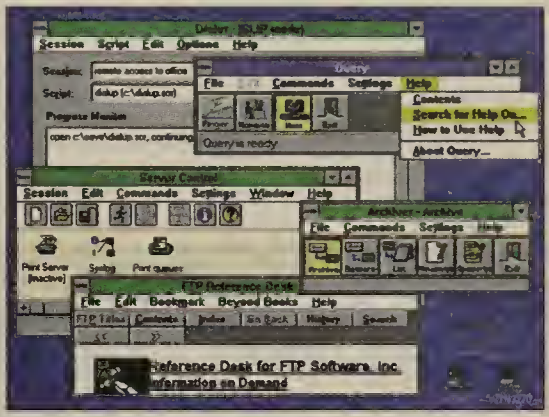

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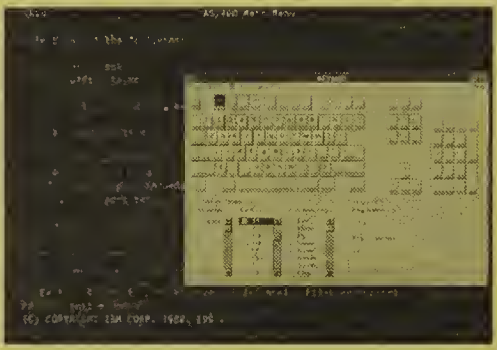

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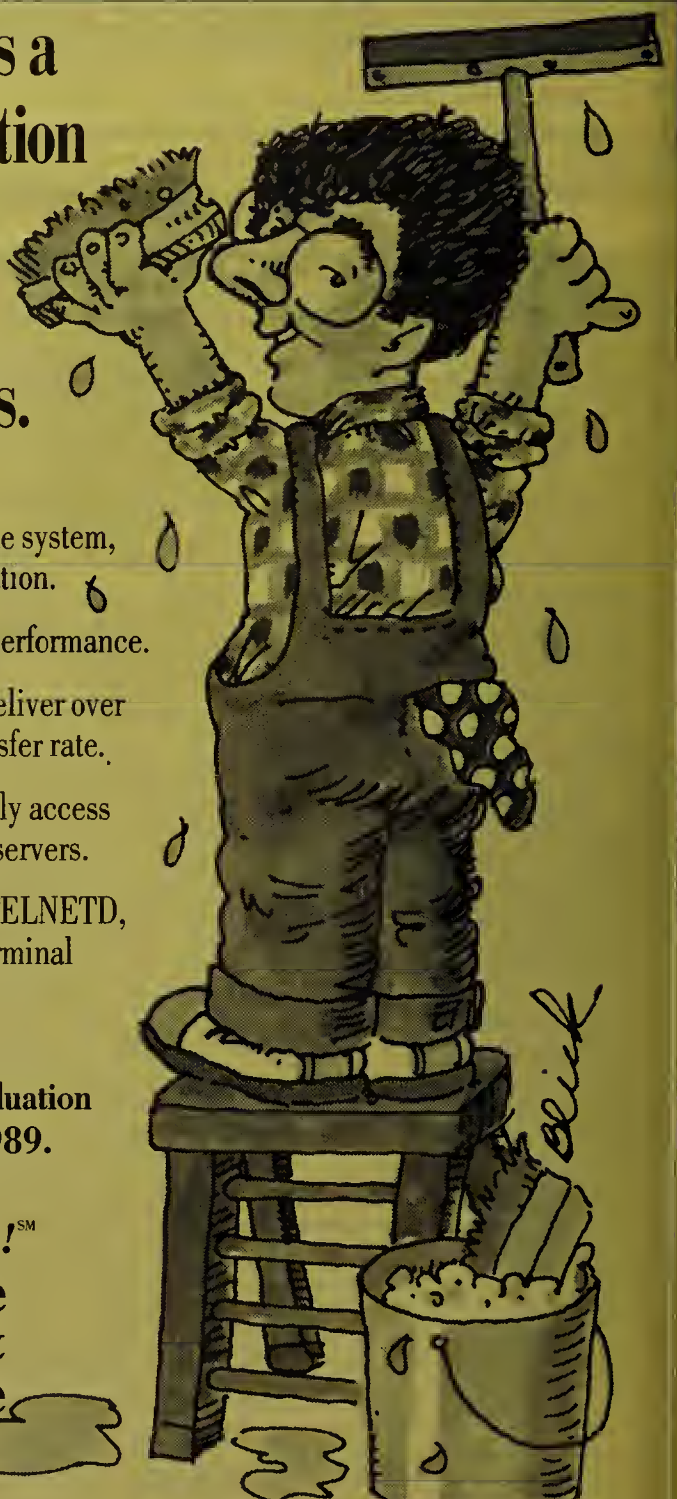

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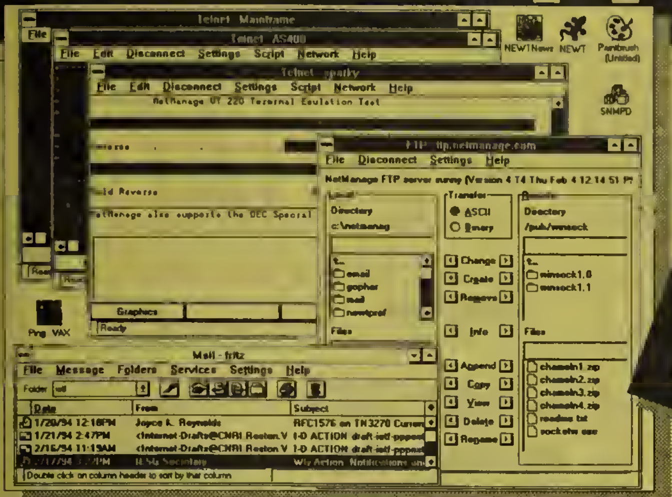

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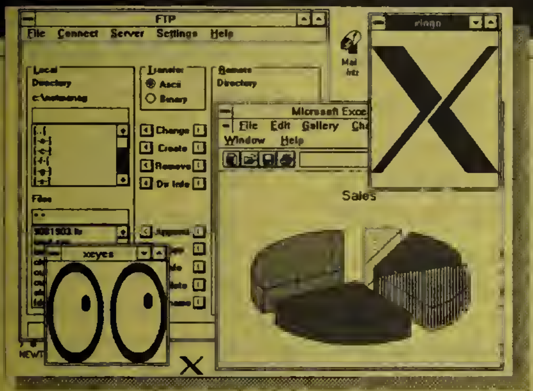

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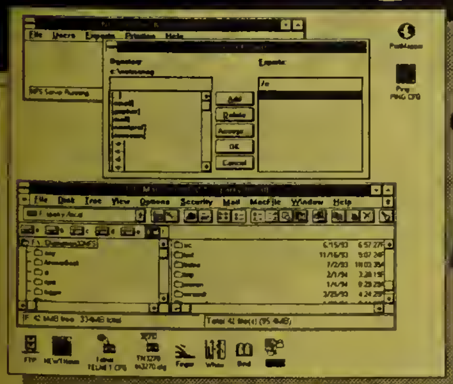

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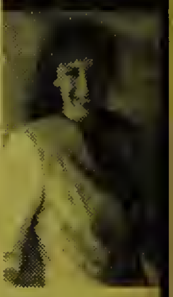

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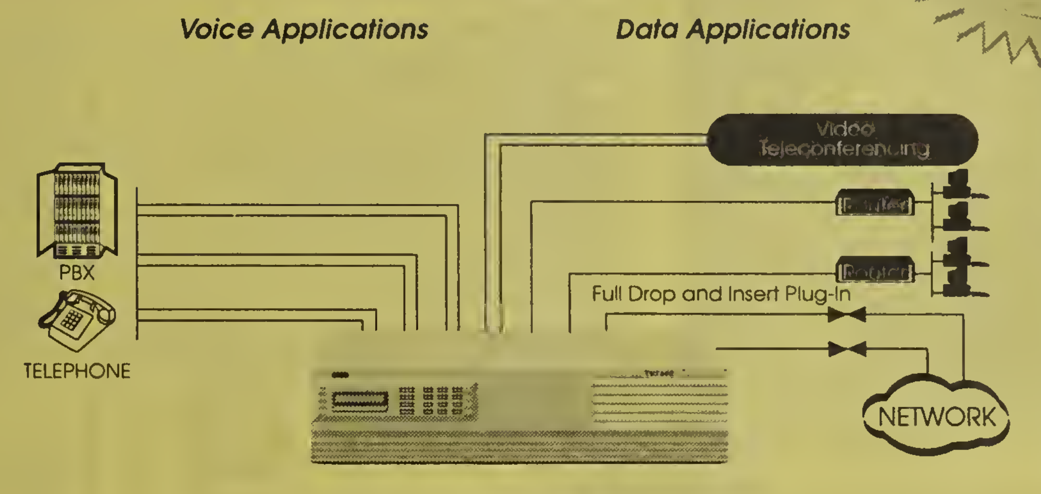

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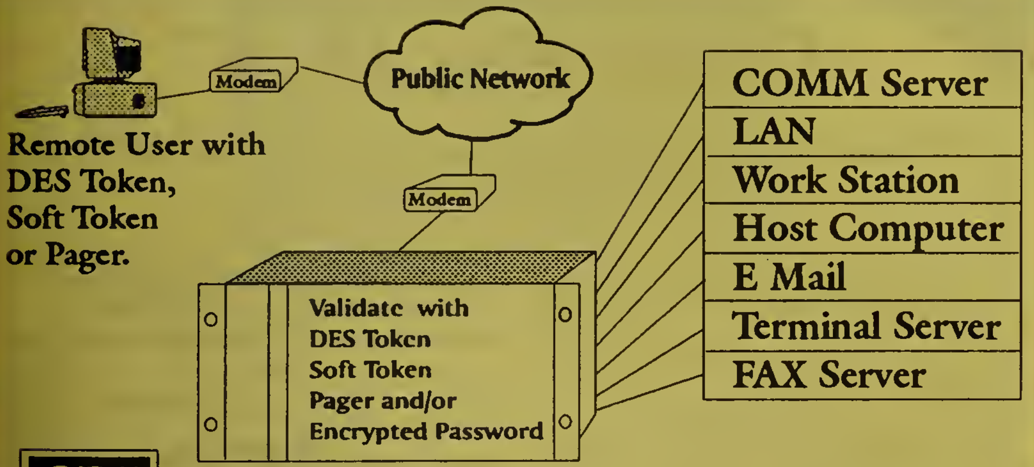
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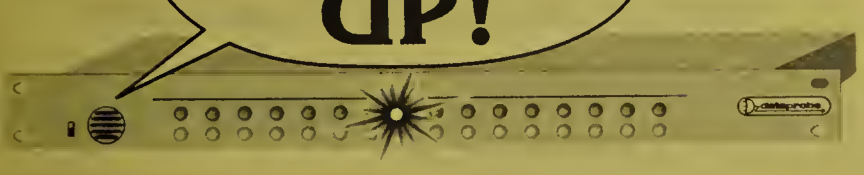

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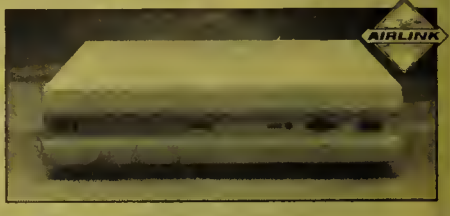

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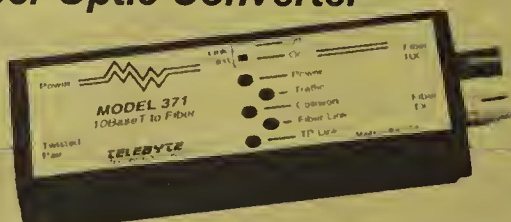

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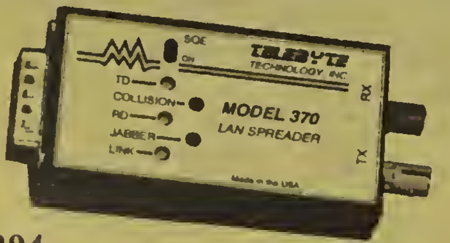

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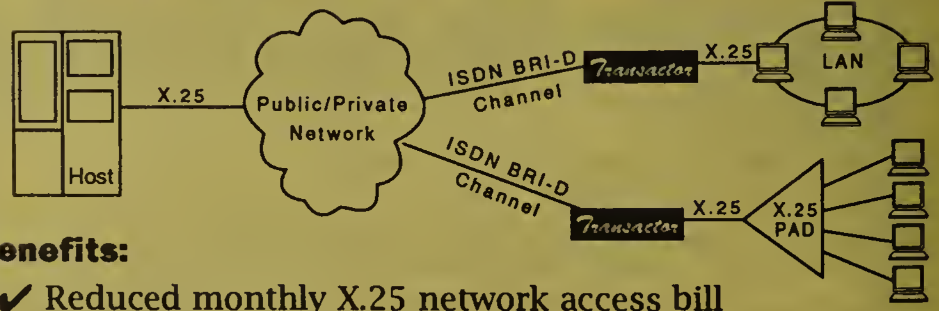

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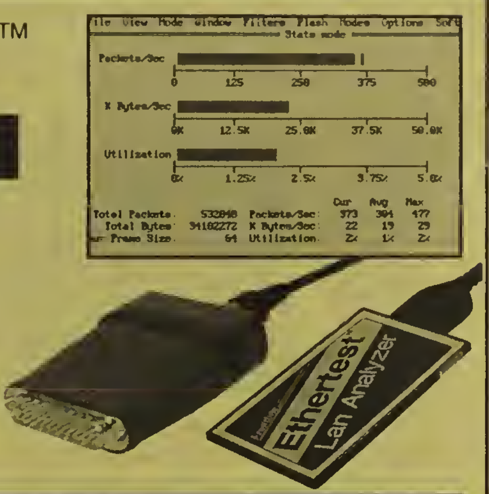

```
State mode
Packets/Sec
0        125       250       375       500
K Bytes/Sec
0K       12.5K     25.0K     37.5K     50.0K
Utilization
0%       1.25%     2.5%      3.75%     5.0%
                                         Cur   Avg   Max
Total Packets    532840  Packets/Sec:    373   304   477
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Frame Size           64  Utilization      2%    1%    2%
```

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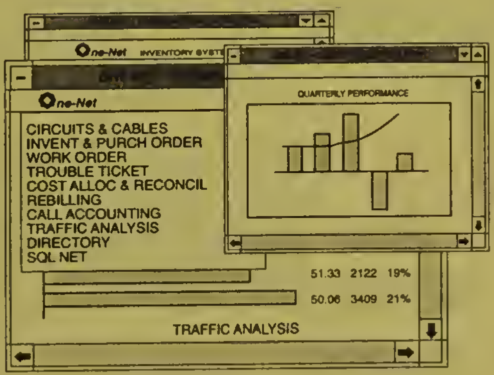

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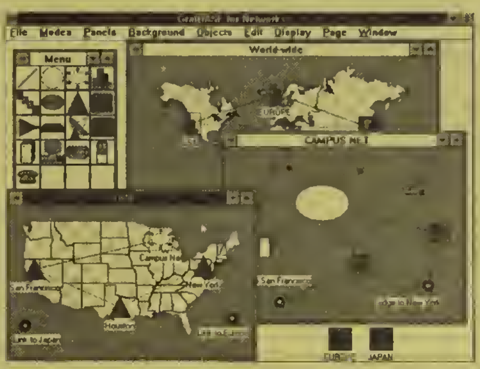
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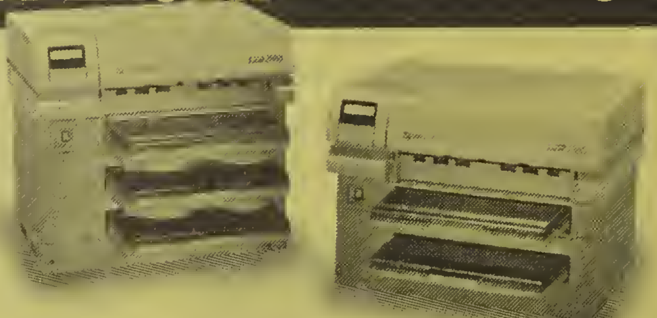

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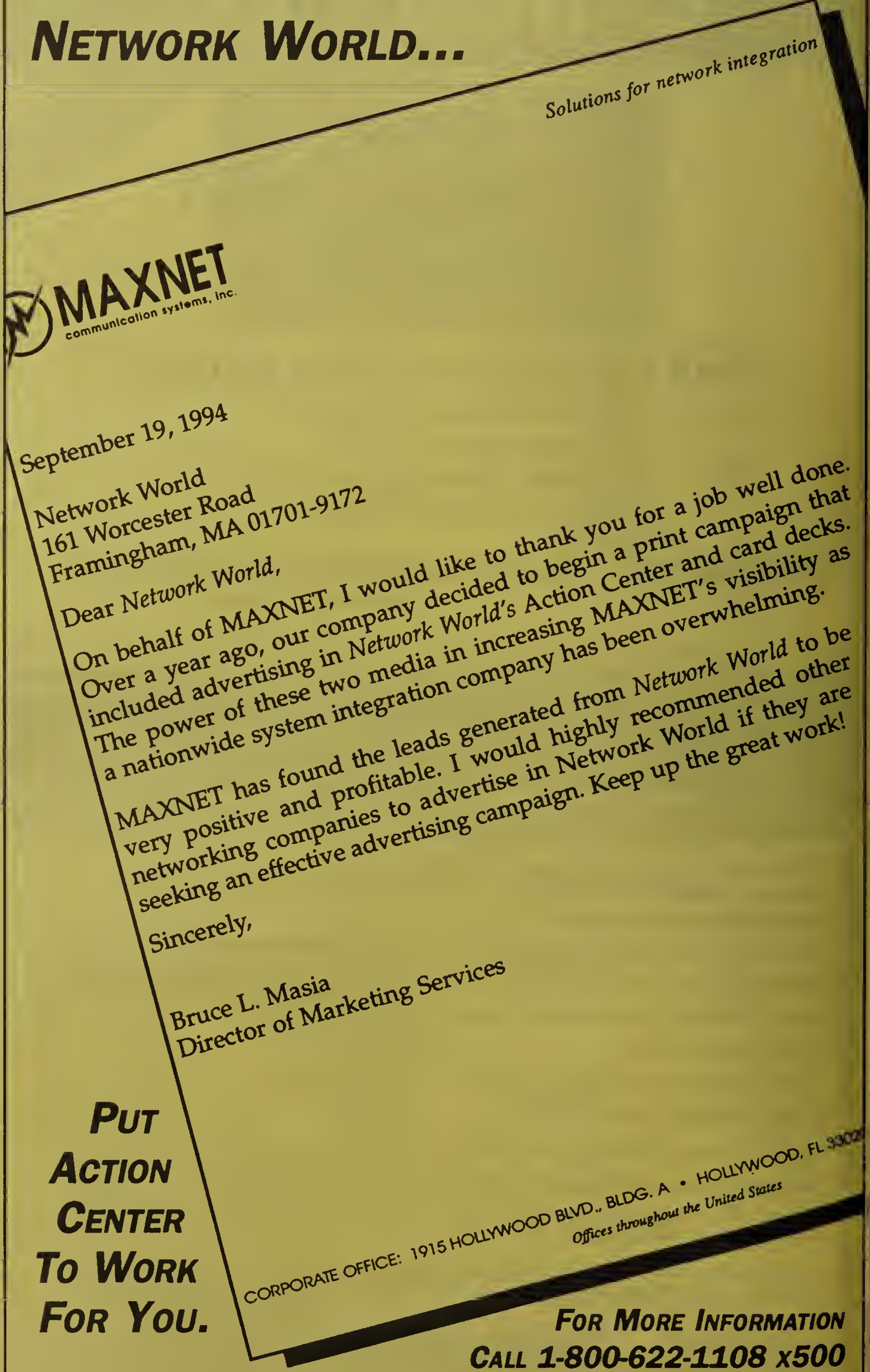

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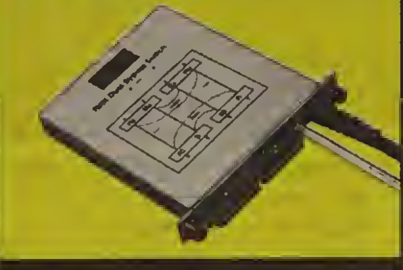

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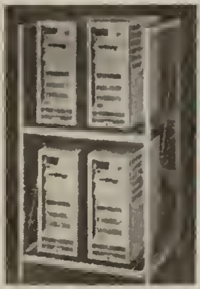

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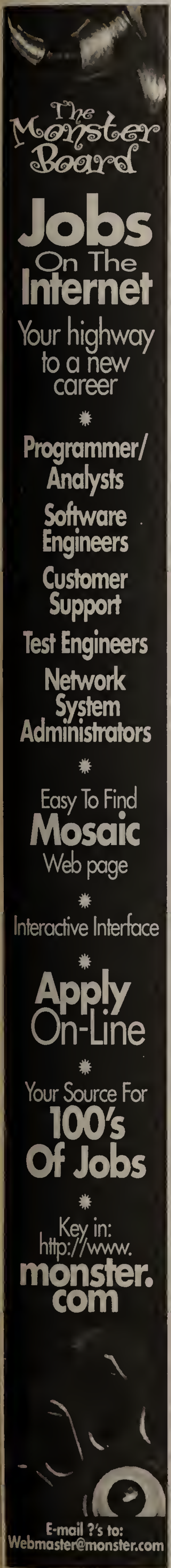

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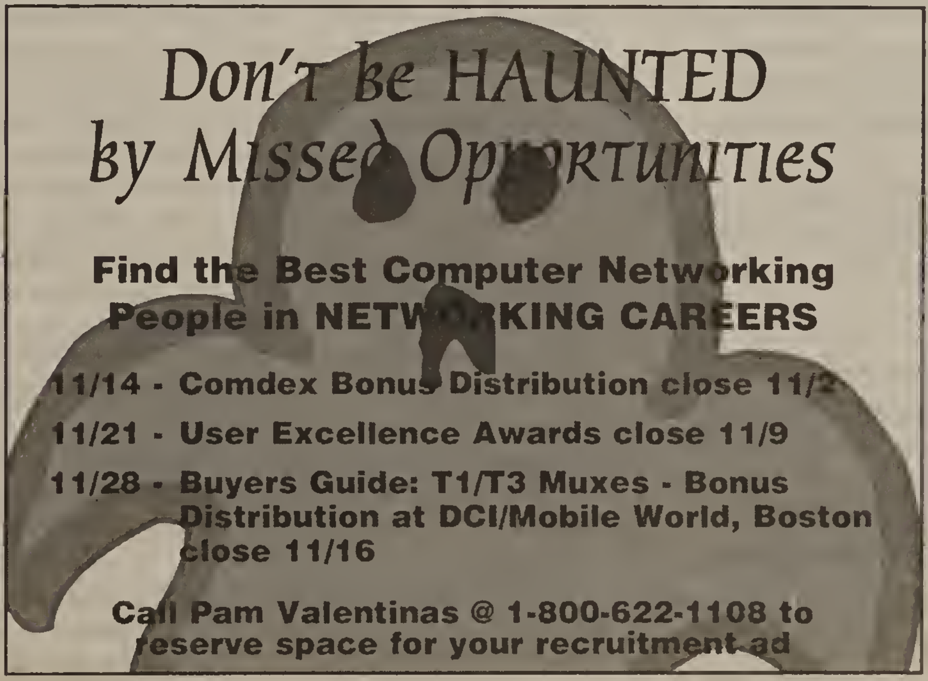

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Censors

Continued from page 1

mail connection and hard drive — and even death threats.

Spafford called it quits, and today you won't see public postings from the man whose guides to "netiquette" are still recommended reading for new Internet users around the world.

"It's a kind of frontier justice — a lynch mob is what it really is," Spafford said of his experiences.

Debates about free speech on the Internet today focus almost exclusively on Usenet, a collection of more than 10,000 conferences where users gather.

But with the proliferation of the World-Wide Web, which lets anyone with a 'Net connection become an on-line publisher, businesses are likely to find themselves immersed in the free speech issue.

Rapid net growth mixed with the culture clash among traditional and neophyte Internet users and the ready availability of tools for disrupting messages have produced a strong brew that could lead to headaches for companies doing business on the Internet. A company — or even just one of its employees — that sparks the ire of a single sophisticated 'Netter could find its network blasted by mail bombs.

WHO'S IN CONTROL?

Much of the free speech/censorship debate boils down to the question of who defines what is permissible on a network that spans national borders and has no central authority.

In that void of authority, many players are trying to exert their influence. Take governments for example: In the U.S., Sen. James Exon (R-Neb.) wants to make service providers accountable for what's posted on their networks. But Canada's experience seems to show the futility of that.

Earlier this year, an Ontario judge issued a gag order on reporters covering a particularly juicy murder case. Several Canadian universities and government agencies then removed a Usenet conference related to the case from their servers. But Canadians with a need to know simply used the Internet to get information from U.S. servers.

In April, Canter & Siegel, a Phoenix law firm, gained notoriety for advertising its immigration services in several thousand Usenet conferences. In response, the messages were canceled, and the site from which the firm posted was mail bombed by opponents who didn't like its tactics.

The Aspen Institute, a Queenstown, Md.-based think tank for social issues, will soon release a report called "Information Rights and Responsibilities," which will set forth broad principles on electronic media and commercial activities.

"One of those principles is tolerance," said Aspen attorney Charlie Firestone. "So what if people don't like advertising? There's a lot of speech people don't like. There should be tolerance of other viewpoints."

"Censorship implies you're preventing them from having a forum because of the content of their message or because they're lawyers," Spafford said. But that's not the case, he said.

What angered people was not the message but the bulk posting of thousands of messages to conferences. Spafford compared that to walking through a park with a boombox turned up all the way.

Long before Canter & Siegel there was Serdar Argic. A Turkish graduate student in the U.S., Argic was determined to convince the world that Armenians killed 2.5 million Turks after World War I — a point he repeated again and again in lengthy messages in numerous conferences.

Some Usenet participants circulated a petition asking UUNET Technologies, Inc., which provided his Usenet feed, to cut him off, arguing that Argic was abusing his right to post. UUNET refused.

"We don't place any restrictions on the content of messages," said spokesman Michael Byman. "Our stated policy is that UUNET exercises no control over content, including ads."

Argic's postings ended when he apparently returned to Turkey. But energized by the Canter & Siegel case, along with other incidences of spamming (everything from end-of-the-world religious postings to ads for thigh-reducing cream), 'Netters are increasingly taking matters into their own hands.

DROPPING MAIL BOMBS

Mail bombs are simple to send — even if they may, by some accounts, be illegal. And there are other tools, such as cancelbots.

Usenet is a store-and-forward network with servers worldwide. Many of those servers use software that lets an individual send out a "cancel" message to delete his or her own postings on other servers.

But it is very easy to forge somebody's identity and send out messages canceling another user's messages. Automating the process takes just a few more steps.

"It's a mechanism that's troubling because it could be abused by people with a purpose other than canceling spamming," said Ron Newman, a researcher at the MIT Media Laboratory.

The 'Net got a taste of what could happen a couple of years ago during the anon-remailer debate. One opponent of the remailers, not Spafford, launched a program to delete any messages coming from a particular remailer in Finland. But there was a mistake in his code, and the program began canceling other messages, as well.

Spafford said many problems that are arising are due to the 'Net's explosive growth. The Internet "has moved so quickly that there hasn't been time to develop good resolution mechanisms," he said.

INTERNET *tip*

BY ADAM GAFFIN

One in a series of occasional tips on Internet-based information services.

Censorship on the Internet

There are several resources, including Usenet newsgroups and World-Wide Web (WWW) servers, related to censorship. They include:

- ✓ **Carl Kadie's Sex, Censorship and the Internet WWW presentation, which includes several case studies.**
- ✓ **The alt.current-events.net-abuse Usenet newsgroup for discussing Usenet abuse and the alt.censorship Usenet newsgroup for discussing general censorship issues.**
- ✓ **The Electronic Frontier Foundation (EFF)'s Censorship document collection.**

To access:
For the WWW server, point your browser at http://www.eff.org/CAF/cafuiuc.html. For the EFF Censorship archive, use Gopher to connect to gopher.eff.org. From the main menu, make the following selections: Publications, EFF papers, Issues and Policy, then Censorship.

Gaffin can be reached via the Internet at agaffin@world.std.com.

Bells

Continued from page 1

vendor of choice (*NW*, Aug. 29, page 1). In two of the other states — Massachusetts and Illinois — Teleport has central office switches ready to provide local dial tone and dedicated access services.

And while Teleport does not have switches in the fourth state — Washington — it does have them in Los Angeles and San Francisco, where it is seeking certification from the California Public Utilities Commission.

The speed with which Sprint can migrate access traffic to Teleport depends on its access agreements with other local exchange carriers. Starting in late 1991 and early 1992, Sprint began signing discounted bulk term agreements with the regional Bell holding companies and GTE Telephone Operations.

Many of those were three-year agreements and are coming due soon, said Bob Runke, Sprint vice president for access management. In California — expected to be a ferocious battleground for access and other carrier services after new state regulations go into effect Jan. 1 — part of Sprint's Los Angeles-area access contracts with Pacific Bell and GTE will begin expiring in February; its San Francisco-area contract with Pacific Bell will begin to run out in June.

"Now the economics have changed," Runke said, adding, "Yes, I will look at it from a stockholder's standpoint."

Runke even hinted that some access contracts may move to Teleport before they expire with RBHCs. "Where I have a contract with the [RBHCs], I would honor it unless the terms of getting out are minor compared to the benefits of switching," Runke said. A contract with a month or two left might be worth paying off if it results in a much better deal with Teleport, he explained.

RBHC officials agreed that Sprint's move dramatically heightens the stakes, especially since a large portion of users rely on their long-distance carriers to purchase local exchange access on their behalf.

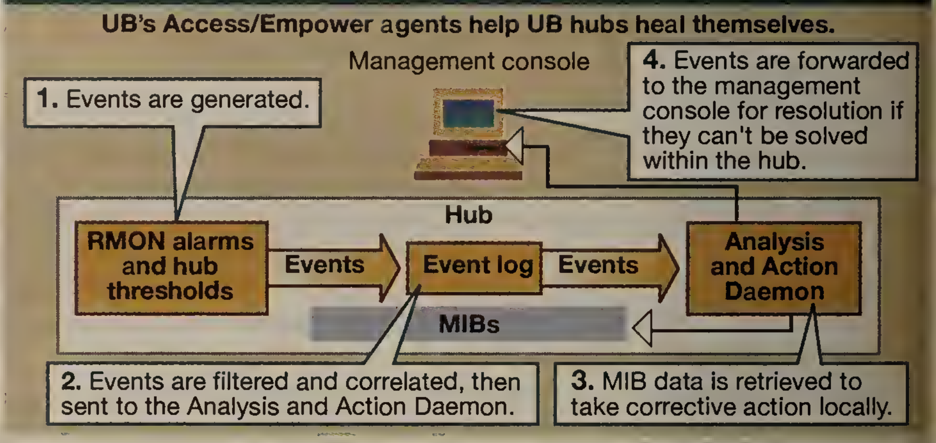
Investigate

Continued from page 9

more proactive — what UB described as self-healing devices — because it automatically initiates corrective action when a fault occurs in the hub. If Access/Empower cannot resolve the fault, it will send an alarm to the management console.

In its first release, Access/Empower applications will watch over the Access/One hub chassis, modules and remote connections, correlating events and gathering traffic statistics on Ethernet segments using the SNMP Remote Monitoring Management Information Base. The applications will monitor performance against predefined thresholds and trigger alarms when those thresholds are surpassed.

Future applications will manage ATM operations within the hub, such as cell segmentation and reassembly, bandwidth allocation, setting up managed domains, automatically responding to events and handling non-SNMP events.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UB's Access/Empower agents help UB hubs heal themselves.

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4. Events are forwarded to the management console for resolution if they can't be solved within the hub.
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RMON alarms and hub thresholds
Events
Event log
Events
Analysis and Action Daemon
MIBs
2. Events are filtered and correlated, then sent to the Analysis and Action Daemon.
3. MIB data is retrieved to take corrective action locally.

Though it only runs on UB's Access/One hubs, Access/Empower will provide value in switched virtual internetworks because it will allow users to define and enforce policies for configuring workgroups, allocating bandwidth, handling events and resolving faults, according to the company. UB plans to add Access/Empower to its GeoSwitch line of Asynchronous Transfer Mode switches.

"It looks like the right direction to put a lot of intelligence" in the hub, said UB user Blair Sanders, a senior member of the technical staff at Texas Instruments, Inc. in Dallas. "We expect to see UB expand that so you can have multiple agents and be able to monitor multiple, logical segments in a hub. Right now, it's a little limited in being able to monitor just the [Access/One] bus and external port."

The Access/Empower hardware module — dubbed Access/Empower Supervisor — fits into an Access/One slot and gathers statistics on hub operations, including backbone connections, power supply, temperature and cooling fans, in addition to monitoring Access/One system modules. When a module is added to the hub, Supervisor dynamically links to the new module and reports the configuration change to the management console.

Pricing for Access/Empower starts at $5,995. It will begin shipping in December with continual rollouts throughout 1995.

✆UB: (408) 496-0111.

"For those access providers who work with Sprint today, if they're not meeting Sprint's requirement for price and performance, I do believe there would be a swing toward Teleport," said Peg Ricca, marketing director for Bell Atlantic Corp.'s carrier services division in Arlington, Va.

At the moment, Bell Atlantic does not appear to be as vulnerable as other RBHCs to losing access business. In a recent study by Sprint's Private Line Services Center, Bell Atlantic scored No. 1 among RBHCs for uptime and speed of provisioning. Runke and other Sprint officials stressed that all access providers, not just Teleport, will still be considered for bulk contracts.

The new relationship between Sprint and Teleport is not without hurdles. For example, since Sprint has been pressing the RBHCs to help deliver end-to-end frame relay services, Teleport may be forced to move more quickly than it otherwise would have to offer frame relay and other fast-packet services.

Teleport Senior Vice President Bob Atkinson would not commit to developing such a service but said the company is evaluating the need. "In order to be the other local phone company, we have to match up fairly well with the existing local telephone company, be it basic [plain old telephone service] or the most advanced services."

Ironically, Sprint's move may provide a benefit to one of its big rivals — AT&T.

While Sprint primarily uses CO switching equipment from Northern Telecom, Inc., Teleport so far has relied principally on AT&T's flourishing Network Systems division.

Both Northern Telecom and AT&T reportedly responded to a recent request for proposals by large cable companies for telephone switching platforms (*NW*, Aug. 8, page 1). Teleport's new ownership arrangement with Sprint potentially gives AT&T a new outlet for its CO switching gear. ◼

AT&T

Continued from page 1

shells are retail, consumer goods manufacturing, financial services and telecommunications.

Several customers have long teamed with AT&T GIS and its predecessor, NCR Corp., for database consolidation on a custom basis. They have used flavors of the technology platform AT&T has now commercialized, called the Enterprise Information Factory (EIF), which sits below the vertical market applications.

The EIF is a set of AT&T and other vendors' processing, storage, database and management technologies. AT&T said some companies using custom versions of EIF have seen a return on their investment by as much as 50 to 1 through better decision-making.

AT&T GIS has provided EIF-like services to the likes of U.K.-based TSB Bank plc and Kmart Corp.

"Unless you have all the data relating to a customer in one place, you don't stand a chance of a long-term relationship with that customer," said Andrew Robinson, TSB's head of customer relationship management. TSB merged nine databases with AT&T's help.

KMART COUP

Kmart Corp. has been using an NCR 3600-based EIF version to get detailed information about sales patterns in 2,500 nationwide stores, said David Carlson, senior vice president of corporate information systems, at the Troy, Mich.-based retailer.

He said the sales and in-stock positions of many Kmart items have improved since the company began using the AT&T technology and expertise: "If we were 80% on the mark before, we're at 90%-plus now."

An illustration of the business improvement, he said, was that in the "old days," if sales reports indicated 80% of a product sold during the Christmas season and 20% was left over, a buyer might conclude that he should stock about 20% less the following year.

"Now, you can see that you sold 80% of what you ordered, but in 50% of the stores, you were out of stock by Dec. 15. You could have sold more if the inventory had been put in the right place," Carlson explained.

NO CONTENT

Chet Geschickter, vice president of research at Hurwitz Consulting Group in Watertown, Mass., said many information systems directors believe they are being thrown technology without context.

"There is a fragmentation of the marketplace. AT&T is stepping up to the plate with an answer to a very important part of the business: customer satisfaction and relationship marketing," he said.

Upon AT&T's EIF sit application shells representing 70% of the needed functionality for each vertical market, said Andre Dahan, vice president of customer solutions marketing at AT&T GIS. Customers work with AT&T to customize the remaining 30%, he said.

EIF-based applications start at $350,000 and can run into several millions of dollars, depending on the size of a company's information base and number of users, Dahan said.

But the EIF will not be for everyone. American Medical International, Inc. in Dallas is tackling the project alone. The health care provider is pulling distributed patient data into a central repository via Oracle Corp. software, said Alan Cranford, manager of systems operations.

"We're not going to have millions of customers with marketing campaigns and follow-ups," he said. "We're a pure services provider."

And some might be put off by an article published in *The Wall Street Journal* in August that divulged how problems with EIF's predecessor, NCR's Warehouse Manager, almost put some companies out business. ◼

Bedfellows

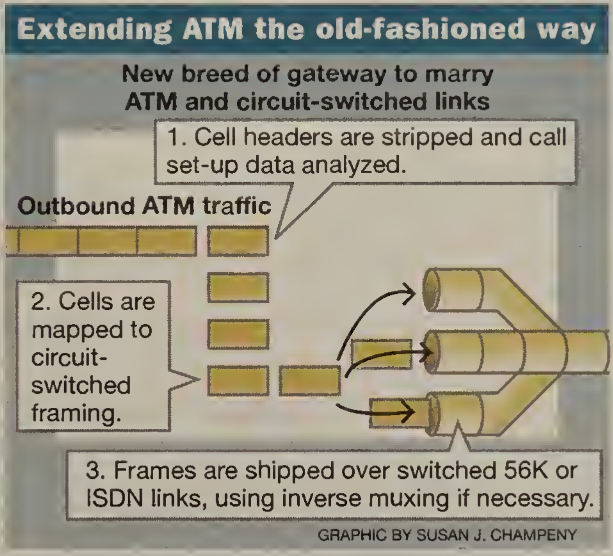
Continued from page 1

These circuit-switched gateways will take local ATM traffic, strip out the cell headers and map the payload to circuit-switched links. Inbound circuit-switched traffic would be converted to ATM cells, with signaling software that forwards the call to any address on the ATM network.

"This is potent stuff," said Gary Nelson, president of the consultancy Zynrgy Group, Inc. in Barrington, Ill. "It's a hot topic that's just starting to pick up now and could be an avenue for ATM to the mass market."

The most immediate benefit would be to let users extend fully meshed ATM connectivity using cheap, low-speed services. New types of ATM- and ISDN-based carrier services could quickly follow.

Something much like ATM switched virtual circuits could be offered to any small office, particularly with ISDN access because the two technologies share similar signaling standards.


Extending ATM the old-fashioned way
New breed of gateway to marry ATM and circuit-switched links
1. Cell headers are stripped and call set-up data analyzed.
Outbound ATM traffic
2. Cells are mapped to circuit-switched framing.
3. Frames are shipped over switched 56K or ISDN links, using inverse muxing if necessary.
GRAPHIC BY SUSAN J. CHAMPENY

For example, a telecommuter with ISDN Basic Rate Interface at 128K bit/sec could initiate a videoconference with anyone on the headquarter's ATM LAN. The telecommuter's video components need not be upgraded to ATM yet could interwork with any compatible video system — room or desktop. The ATM system would simply throttle down to match the ISDN traffic rate.

Data and voice traffic could be handled, as well, with voice traffic directed to the headquarter's PBX. Sources said that AT&T is planning an ISDN/ATM gateway for its Definity G3 PBX that will convert ISDN traffic to ATM cells, handing them off to a campus ATM switch.

ACTIVE VENDORS

Curiously, the large ATM switch vendors are not pioneering circuit-switched ATM access. Instead, Teleos and Ascend are the two most strident instigators.

Both companies have focused for several years on circuit-switched access to corporate networks. Teleos' forte is in providing multiple ISDN BRI channels for desktop and room-system videoconferencing. Teleos' NetworkHub multiplexers also support data traffic, with access to leased lines and a variety of dial-up services.

Ascend's Pipeline Max is a similar access device that provides BRI connectivity. It can simultaneously be used as an inverse multiplexer and channel bank, among other things.

Both companies plan a similar ATM migration early next year.

Ascend is working on a two-phase approach, said Robert Ryan, the firm's founder and chief executive officer. Early next year, Ascend will provide an ATM gateway to circuit-switched services. In the latter half of the year, it will offer a normal ATM interface to wide-area services.

"Phase One to me is more interesting," Ryan said. "Users deploy ATM as a LAN infrastructure and can then use high-speed dial-up services for traffic over the wide-area."

To complement its ATM effort, Ascend is developing a new product, the Pipeline Super Max. While the Pipeline Max supports up to four T-1s, the Super Max will handle a T-3 aggregate of 45M bit/sec.

Ryan said Ascend's ATM plan is not driven by users clamoring for circuit-switched connectivity. "This one is a dice-roll, a gut feeling we had. We haven't yet started on this product, but we'll put it together pretty quickly once we evaluate the market and get serious."

Teleos is closer to an actual product offering through a partnership with First Virtual Corp., a start-up focused on multimedia ATM applications support.

First Virtual will provide an ATM-to-ISDN gateway for Teleos' NetworkHub access multiplexers. The same gateway can be installed on First Virtual's Media Switch, which will support ATM-based multimedia applications on the LAN.

The gateway will be ready toward the end of the first quarter next year, according to First Virtual founder and CEO Ralph Ungermann.

"We'll deliver their [Teleos'] BRI interface across the ATM LAN directly to PCs, along with native ATM and Ethernet, all on the same PC adapter," Ungermann said.

Teleos will use the gateway to connect ATM LANs over wide-area ISDN links. "The nice thing about it is that you can use the existing circuit-switched infrastructure and still preserve all the delay characteristics that ATM traffic demands," said Jim Flach, Teleos' chairman and also a general partner at Accel.

The wide-area ATM switch vendors ultimately will play a role, as well. StrataCom, for instance, recently touted low-speed access as a key part of its business and is rolling out several frame relay access products. ATM wares will follow, but the firm would not elaborate. ◼

NETWORK WORLD

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Framingham, Mass. 01701-9172
(508) 875-6400

Second-class postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0385662. *Network World* (USPS 735-730) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World, Inc., 161 Worcester Road, Framingham, Mass. 01701-9172.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-508-820-7444.

Non-qualified subscribers: $5.00 a copy; U.S. A $95 a year; Canada A $117.70 (including 7% GST, GST #126659952); Central & South America A $110 a year; Europe A $165 a year, all other countries A $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label from front cover of the publication.

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POSTMASTER: Send Change of Address to *Network World*, P.O. Box 3090, Northbrook, IL 60065.

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ISSN number: 0887-7661.

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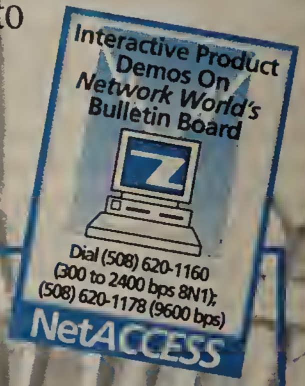
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BELL ATLANTIC OF PENNSYLVANIA
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COMPAQ
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Teletutor Demo. Demonstration on Frame Relay applications and technology. Fixed disk and VGA req.

DATAPROBE
Annunciator Demo. Communicating Annunciators monitor and report remote and local network alarm events.

DYNATECH
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CD-ROM Demo. Network information CD-ROMs.

EXPRESS SYSTEMS, INC.
Express Meter Working Model.

FAULKNER
CD-ROM Product Info. Describes MicroData, Communications and Dataworld Infodisks.

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NETWORK DIMENSIONS
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2. GrafBASE Demo. A graphical database for managing and presenting LAN and MAN configurations.

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NETWORK WORLD

Back to Reality

Freedom of speech meets Internet censors; Cisco snubs IBM.

BY DAVID J. BUERGER

It's ironic how some Internet users champion the 'Net's "cooperative anarchy" yet seek to stifle freedom of expression.

This week, Martha Siegel's book, *How to Make a Fortune on the Information Superhighway,* debuts. Siegel is the infamous Scottsdale, Ariz., attorney who last April was blitzed with more than 20,000 flames for posting an advertisement offering immigration services to myriad Usenet newsgroups.

What angered many users was the distribution of the ad to newsgroups that had nothing to do with immigration issues. Others were simply upset at seeing an advertisement on the 'Net.

Some Internet purists view the Internet as their proprietary baby and reject content they label as inappropriate. Yes, that is what advertising is – another form of information content.

A few extremists are not just condemning advertising over the Internet, they are fighting back.

One of their weapons is the mail bomb. This type of electronic vandalism entails sending hundreds or thousands of E-mails to a target considered undesirable. In Siegel's case, this extraordinary traffic shut down her service provider, Netcom On-Line Services, Inc.

This tactic sounds like something we'd hear from Earth First, not the enlightened world of high technology.

On one level, this action challenged Siegel's freedom of speech, which is one of the most cherished rights guaranteed by the U.S. Constitution.

Any move by a handful of extremists to curtail expression is reprehensible and must stop. They might dislike what they read, but mail-bombing does greater harm because it shuts down communications for everyone.

Siegel said her ad triggered about 20,000 requests for more information and generated $10,000 in new business. Clearly, there is lots of interest – for vendors and buyers – in using the Internet for more than technical chitchat.

Book sellers already have purchased three-fourths of her book's initial print run of 100,000 copies, according to Siegel.

So how do we resolve the conflict between vendors that want to use the Internet for direct mass access and end users who might want that information but hate getting junk mail?

Clearly, any vendor that sends out voluminous Internet advertisements could see the effort backfire. Filling individual E-mail boxes with unsolicited ads would be an obvious nuisance. Programmers already are creating ways to filter unwanted E-mail messages.

Eventually, the volume of E-mail traffic to us mortals could become unmanageable. I hope not. Meanwhile, my advice to Internet entrepreneurs is to go easy with mass mailings to individuals or list servers. Well-targeted mailings will draw fewer complaints.

The conflict shouldn't dwell on *whether* or not to advertise; that's a fact of life. Solutions should focus on how advertising is conducted.

The most appropriate place is in targeted public newsgroups or on information servers that require people to choose their type of access. Advertising is simply another form of information. And information access is an individual right, whether a minority agrees or not.

Cisco, the spoiler

IBMers are wringing their hands over Cisco Systems, Inc.'s purchase last week of Kalpana, Inc. Rumors that IBM would purchase the Ethernet switch vendor have circulated for months.

Guess the early bird didn't get its worm.

The purchase, however, is another example of big vendors hedging bets on a myriad of hot technologies.

Ethernet switching – Kalpana's main market – is hot. Kalpana said its 1994 revenue will be $35 million to $40 million. Analysts claim this will rise to about $1 billion in 1997.

Users are searching for simple ways to boost Ethernet performance, especially for heavy-duty applications and server-to-server links. Switched Ethernet dedicates channels for designated nodes to overcome its inherent packet collision-based technology.

Ironically, switched Ethernet was a mystery to most LAN managers just a few years ago, even though it resembles nonblocked PBX technology that has been around for a decade. It just took awhile for LAN managers to catch on and see how an old technology still holds its weight.

Novel concept

Moving ATM LAN data over circuit-switched wide-area links is one example of how the real world will next year migrate to new technology.

The basic idea is to allow bleeding-edge ATM LAN users to send data through gateway access devices over ISDN or switched 56K bit/sec links. Alternately, this scheme will allow remote users to dial in to ATM LANs via ISDN.

The latter aspect is the most exciting because it will give remote office and home users quality use of home office multimedia applications. This may be one case where these users aren't just an afterthought.

➜ Buerger is an industry consultant and contributing editor to *Network World.* E-mail your reactions to dbuerger@pipeline.com or call (516) 883-4944. Flames are welcome (just kidding).

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CyberSpeak

Voices from the reader network

Cisco says the best way to pull mainframes into LAN internets is through channel-attached routers. Do you agree?

◆ "Yes, I agree. Having the option to channel-attach a router is a feature I've wanted for some time. My primary interest is the ability to support a growing requirement for high-speed access to TCP/IP on the mainframe.

"With the channel-attached router, I can also simplify my network design. If the same router can support our LAN-attached SNA resources, it would seem ideal, but I would move carefully on the SNA side to ensure [that the router] has the same functionality as the [front-end processor]."

Bruce Lee, senior network analyst, San Diego Gas & Electric, San Diego

◆ "Integrating direct channel attachment into Cisco routers provides better and tighter mainframe-to-LAN connectivity. Channel-attached routers offer better performance through fast RISC processors than do adapter-based solutions. Other advantages include tighter net management integration and a single cross-platform connectivity vendor."

Bang Tran, technical support manager, Microdyne Corp., Alexandria, Va.

◆ "The concept is enticing, but it will be a giant leap of faith to consider channel-attached routers over more conventional host gateways. Router manufacturers will be challenged to provide adequate reliability and support, and to stay current with architectural changes, such as VTAM support for APPN or 3172 support for ATM.

"For SNA gateway applications, it is unlikely that a channel-attached router will provide the capabilities of [Network Control Programs]. This presents serious cost-of-ownership issues, as VTAM cycles on the host increase anywhere from 3% to 6% if NCP is not available."

Bruce Caswell, director of marketing, Centron DPL Co., Eden Prairie, Minn.

NextWeek CyberSpeak Out!

Sprint has grabbed a stake in the local exchange market, something all the big long-haul carriers are doing. Is this a healthy trend?

Responses due by 8 p.m. Thursday, Nov. 3. You'll get a T-shirt if we print your response. Please include your name, company and address.

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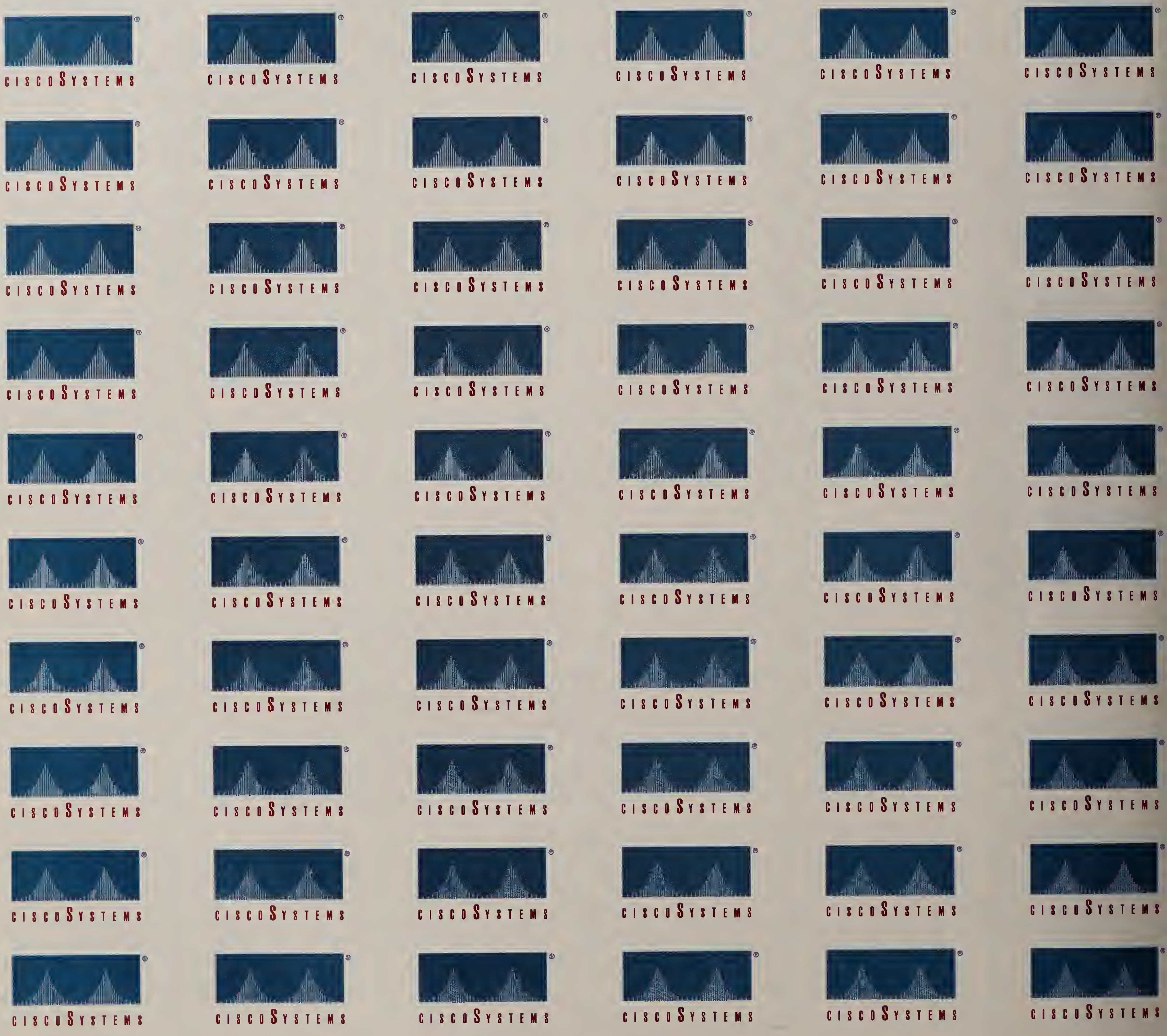

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